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STEEL

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The Magazine of Metalworking and Metalproducing

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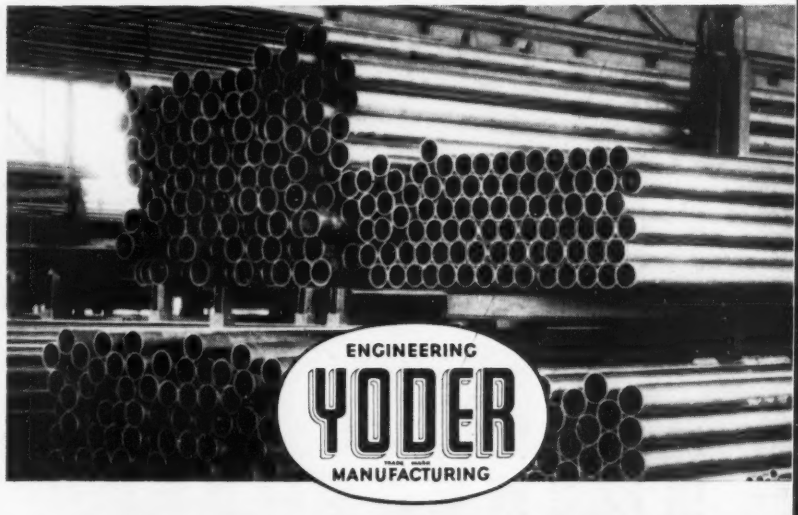

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AS THE EDITOR VIEWS THE NEWS

ies, which employed 5,888,944 persons and added $29,343,012,000 in value from manufacture. The industry's gross production volume in 1947 was $62 billion, compared with $19.4 billion in 1939.

Of the 50,286 companies, only 24.4 per cent employed more than 50 persons, yet this minority employed 92.3 per cent of the total labor force and accounted for 90.3 per cent of the value added by manufacture.

It is a tremendous industry, made up of an interestingly variegated collection of individual units. —p. 46

* * *

DID WE MISS THE BOAT?: Joseph Z. Reday, former chief of the industrial division on General MacArthur's staff in Tokyo, has written a concise report on the present status of Japan's iron and steel industry. After reviewing that nation's difficulties in obtaining iron ore, coking coal and scrap, he concludes that it is unlikely that Nippon will become a serious competitor in the export of steel to Far Eastern markets.

Mr. Reday believes that if American policy had permitted, Japan's steel industry could have eased the postwar tight steel situation. "In spite of proposals from many American firms to supply coal, iron ore and so on and take steel products in return, all such proposals were denied," declares Mr. Reday. "Our authorities in Japan also denied proposals to utilize idle plant capacity in Japan on a rental or royalty basis . . . The production and export sale of several million tons not only would have eased somewhat the acute world shortage, but could have paid a good portion of the cost of occupation." —p. 68

* * *

PROFIT BY EXPERIENCE: For many years numerous companies have been accumulating experience with pension plans for employees. Almost invariably this experience has proved that it is far easier to underestimate the cost of a pension plan than to overestimate it. In numerous instances, too ambitious plans have had to be modified or abandoned because the actual cost far exceeded estimates.

Cost of the miners' welfare fund was underestimated by a wide margin. The original levy of 10 cents a ton proved inadequate and now the current royalty of 20 cents is running short of actual requirements. Competent actuaries say the 11¼ cents per hour figured by the United Steelworkers is insufficient for the size of pensions demanded. Pensions are desirable, but unless they are established on a sound basis, they will backfire. Less haste and more study would be beneficial in the present issue of pensions for steelworkers. —p.37

* * *

CONSERVING IRON ORE: Steelmaking subsidiaries of United States Steel Corp. will build five plants to process powdery iron ore to usable size and to recover iron from blast furnace flue dust.

Over a period of ten years, a metallic loss of about 3 million tons can be traced by U. S. Steel to the presence of fines in iron ore. Although in 1948 the ten existing Corporation sintering plants for processing flue dust produced 3,400,000 tons of sinter, more dust is being recovered than can be sintered by existing machines.

Completion of the five new plants will add 1,800,000 net tons annually to the high-grade ore available for U. S. Steel's blast furnaces without entailing any increase in its iron mining operations. In fact, the recovery program not only will conserve ore but it also will provide furnaces with a charge of higher iron content than that of the ore as mined, and of superior physical properties.

The increased interest in sintering facilities displayed by U. S. Steel and other steel producers in recent years is timely and constructive. —p. 40

* * *

CAREFUL PLANNING PAYS: Reconditioning used or damaged steel drums involves thorough cleaning, removal of dents and closing of openings, painting, drying and inspection. These are comparatively simple operations, but the extent to which they may be made automatic through the use of specially designed equipment and carefully planned procedures is amazing.

In a Cleveland plant special washers, rotary scrubbers and powerful sprays are combined with a "chaining" machine for the cleaning operation. A "chime sealer" takes out dents and closes openings. A spray painting machine and a conveyor-infrared oven combination process 90 heavy, returnable 55-gallon drums per hour. Conveyors carry drums from one operation to the next and to the shipping platform so that manual handling is reduced almost to zero.

The entire installation is replete with good ideas for cost saving. —p. 73

E. C. Shaner

EDITOR-IN-CHIEF

News Summary

HOW'S BUSINESS?—Metalworking executives are watching the spot indicators in the business picture closely, hoping to find evidence of a definite upturn. Most statistics and indexes now coming out relate to conditions of a month or more ago and are not much help in appraising the current situation. More significant is the fact the steelworks operations last week held the gains marked up the preceding week and demand from steel consuming industries is a little stronger (p. 109). A number of metalworking companies are stepping up operations and in some cases adding new workers to the payroll (p. 35). Not all the news is good, however, and a considerable number of companies find business still in the doldrums (p. 36).

LABOR— Recommendations to be made late this month by the special fact-finding board in the steel wage dispute are awaited with interest (p. 37), for the steel settlement will influence the contracts in the metalworking and many nonrelated industries. Steel spokesmen this week will have their innings before the board and will argue that a wage increase at this time would be against the public interest. The union wound up its presentation last Wednesday, asked for a package increase which it estimated would cost 30 cents an hour and which includes a 12½-cent wage increase, $125 monthly pensions and social insurance. Some observers expect the board to recommend a modest wage increase, social insurance and joint consideration of the pension problem.

CONSERVING IRON ORE—U. S. Steel subsidiaries are building a series of new sintering plants which will make some 1.8 million tons of iron ore available to blast furnaces without requiring an increase in ore mining (p. 40). They will recover iron from flue dust and utilize iron ore fines.

METALWORKING EARNINGS— Financial statements of metalworking companies for the second quarter show that earnings dropped 8 per cent from the first three months this year. First half profits, however, are slightly higher than for the comparable 1948 period (p. 39).

BUICK'S NEW CAR— The new Buick Special will hold the big interest in auto circles this week (p. 49). Reportedly designed to sell at a price competitive with the light cars, Buick hopes to concentrate 65 per cent of its production in this model, and maybe move up to third position in point of sales. The new Special marks the first appearance of the General Motors "B" body, follows traditional lines.

METALWORKING CENSUS—The metalworking industry in 1947 included more than 50,000 companies, employed nearly 6 million workers, produced goods worth $62 billion, of which $29 billion was added by the manufacturing process (p. 46). The metalworking industry thus stands alone in point of size, towers above the food, petroleum, chemical industries. Slightly more than 12,000 plants employ more than 50 workers, but these plants account for more more than 90 per cent of the industry's employment and production.

EUROPEAN TRADE— Europe is not depending upon ERP or ERP-sponsored programs alone to break the log jam in intra-European trade (p. 45). Marshall Plan nations look to industrial fairs, standardization and new drives for markets to aid commerce.

HERE AND THERE IN INDUSTRY— "Phantom" war orders calling for $74 million in equipment have gone to 99 cutting tool makers (p. 47) . . . Kaiser Steel Corp. is the new name of Kaiser Co. Inc. (p. 52). . . General Motors Corp. will build a diesel-electric locomotive plant at London, Ont., Canada (p. 52) . . . Thomas Steel Co. is spending $1.2 million to install a cold reduction mill (p. 40) . . . Pacific Steel Corp. has nearly completed five open hearths (p. 40) . . . Tinnerman Products Inc. will build a $1.5 million plant near Cleveland (p. 41) . . . A highway program costing more than $11 billion is slated for congressional attention next year (p. 42) . . . Marriages and the birth rate are on the decline (p. 44) . . . Both exports and imports of iron and steel declined in May (p. 41).

Engineering News, p. 63 *Market Summary, p. 109*

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Business Weather: Partly Cloudy, but Moderate

Brightest spot is modest strengthening in demand for steel, other products

BUSINESS weather men are finding the economic situation partly cloudy with moderate temperatures for the immediate future.

Brightest spot on the horizon is the modest strengthening in demand for some products, notably steel, but barometer readings have yet to indicate whether steel's upturn is genuine recovery, stabilization only or protective buying against a possible strike in September. Scattered instances of upward inventory adjustments are noted. Furniture and bedding makers, for example, are buying wire products again. Scrap prices are firmer and lead has gone up another ¼ cent, to 14.55-14.60 cents, St. Louis.

Cycle Near Bottom — Purchasing agents think the declining cycle is approaching bottom. July business slumped further, but at a slower pace than in May and June. Economic indicators generally reflect gloom, but the statistics often lag six to eight weeks.

Department of Commerce terms the business slide mainly psychological in origin, blames caution in industrial purchasing and points out that personal incomes are now at the annual rate of $212 billion, compared with a $206.6 billion rate last year.

Commerce Secretary Charles Sawyer, on a tour of industrial areas, emphasized this fact in pronouncing conditions "sound" in Detroit and Cleveland. Private business analysts argue that despite this silver lining, a cloud still exists—caution in personal buying.

Construction Gains — Construction shows more than seasonal gains, but much of this is accounted for by large public projects. Westinghouse finds that the firmer areas in the nation's economic structure include the construction, chemical and electric utilities industries. General Electric believes demand for capital goods will drop another 10 per cent by yearend and 20 per cent for consumers' products.

Auto builders continue to set the pace in the metalworking field. A possible 700,000 cars and trucks may be assembled this month, an alltime high. The record for a single month is 663,811 units, built in April, 1929. Even in this industry, however, the bus market is weak and truck demand is tapering.

Hot Air Inflates Cooling Equipment Sales

NATION's hot spell has put the heat on sales of air conditioning equipment, refrigerators and fans. Many executives look upon the weather as a psychological godsend which has toned up sales forces and provided an impetus for good business during the colder months ahead.

A Cleveland distributor of fans reports business volume 70 per cent ahead of last year. Another large distributor of all types of air cooling equipment says July volume was the highest in its history.

Alltime sales records have been set in only a few instances because manufacturers proved inaccurate weather prophets and originally kept production at conservative levels. Fans have been in best supply, refrigerators poorest. Frigidaire Division of General Motors Corp., however, has recalled 750 employees at its Dayton, O., plant. A total of 1000 have been rehired there since July 19. George W. Mason, president of Nash-Kelvinator Corp., says demand for refrigerators was "unexpectedly strong" in June—sales during the second quarter were 37 per cent higher than during the first—and production schedules were increased in July.

Servel Faces Bright Future

"SERVEL is over the hump of a buyers' market and faces an optimistic future." So said Louis Ruthenburg, president of Servel Inc., Evansville, Ind. Attributing future growth of the company to expansion of the natural gas industry, he said, it "needs gas refrigerators, gas air-conditioning and water heaters to insure healthy growth."

Confronted with a highly competitive market, he said, Servel products "must be sold by specialized, well-trained dealer salesmen carefully selected and trained in great numbers. It will keep us on our toes in the future sound and natural market."

Tappan Boosts Stove Output

TAPPAN Stove Co., Mansfield, O., has rehired 50 workers to boost stove production 10 per cent.

Of the 200 employees laid off earlier in the year 150 have been taken back. The company has 700 on its payroll.

Thor's Accounts Receivable Fall

THOR Corp., Chicago, maker of home laundry appliances, reports that, despite rising sales, accounts receivable have been declining.

"This reversal of a normal trend," says Raymond J. Hurley, chairman, "indicates very satisfactory collections and that sound financial conditions are enjoyed by our distributor-dealer customers."

Sylvania Lamp Business Holds

SYLVANIA Electric Products Inc., New York, reports that its lamp business, both incandescent and fluorescent, has stood up remarkably well. The radio receiving tube volume, although down considerably from last year, remains at a good level.

Only with two items—cathode ray tubes and fluorescent lighting fixtures—has the company noted a serious decline.

Plumbing Market Potential Vast

VAST market for steel plumbing fixtures exists aside from new building or replacement needs, says Edward Mackasek, managing director of Porcelain Enamel Institute.

There are still about 13 million bathtub-less homes in America and 8 million homes without running water. Roughly one-third of all dwellings in the country do not have private baths.

In addition to the undeveloped markets, more than 900,000 new dwelling units are due for construction this year. Records indicate that about 1.9 million bathtubs, 2.5 mil-

lion kitchen sinks and 3 million water closets and lavatories were produced last year.

Schick Resumes Production

SCHICK Inc., maker of electric razors, has opened its Stamford, Conn., plant, closed since April 21 when 500 workers were laid off. K. C. Gifford, president, who had closed the plant because sales were below anticipated volume since last November, said future business prospects "appear to be excellent." By mid-August the Stamford plant should be back in full production with 500 workers on the payroll.

"Caution" Causes Business Slide

BUSINESS slide has resulted mostly from "continued caution" in industrial purchasing, the Commerce Department reveals in an analysis of economic conditions.

This "caution" caused a "moderate decline" in U. S. industrial output and prices during the first half of this year, the department said.

Commerce estimated personal incomes from January through May, 1949, at an annual rate of $213.1 billion, compared with $206.6 billion in the like period last year.

Westinghouse Cites Firm Areas

PRESENT conditions indicate that the firmer areas in the nation's business structure include the construction industry, chemicals and electric utilities, Gwilym A. Price, president of Westinghouse Electric Corp., says.

New orders received by his company during the first half of 1949 totaled $467,122,984, a drop of 12 per cent from those received in the same 1948 period. On June 30 the company's order backlog was $602,820,861, compared with $678,925,183 a year earlier.

Net income for the first six months of 1949 was $28,409,961, compared with $27,441,100 for the same 1948 period.

Construction Work Gains

CONSTRUCTION work climbed "more than seasonally" to $1,913,000,000 in July, Commerce Department discloses.

This is 10 per cent over the $1,745,000,000 recorded for June and 2 per cent above the $1,874,000,000 level of July, 1948. Value of new private construction totaled $1,371,000,000 in July, an 11 per cent rise over the previous month, mainly because of a 17 per cent boost in private home building. Public construction advanced from $506 million in June to $542 million in July, a 7 per cent rise.

Total new construction for the first seven months of 1949 was listed at $10,353,000,000, 3 per cent over the $10,033,000,000 registered for the like period last year.

Demand Up for Non-Cooling Fans

MAKERS of fans for purposes other than air conditioning are experiencing an unexpected boost in demand although their business is not normally boomed by hot weather.

The industry finds that sales are now 10 to 20 per cent above the average for the first six months of the year which, itself, was only moderately below the 1948 peak. Chief reason for the showing probably is the continued high rate of private home construction and the consequent need for fan-equipped furnaces.

Building Firm Optimistic

CONSTRUCTION volume for the H. K. Ferguson Co., Cleveland industrial engineering and building firm, for the first half of 1949 exceeded $25 million. Otto F. Sieder, executive vice president and general manager, said this compared favorably with other six-month periods of the past two record-volume years. Construction consisted of government and industrial facilities at home and abroad.

"Our present curtailment reflects general curtailment of construction in almost all fields of industrial activity," Mr. Sieder said. "It is consequently lower than it was at this time last year, but we are optimistic that it will return to a higher level in the next six months.

"As we begin to reduce our domestic backlog," he added, "we must look to foreign lands to provide outlets for our services."

GE Head Predicts Cutbacks

PRODUCTION of consumers' goods by the end of 1949 will have been cut by at least 20 per cent and producers' goods by about 10 per cent, says Charles E. Wilson, president of General Electric Co.

"This is an estimate," he reports, "based on present downward trends in such major appliance items as ranges and washers. Radio receiver sales are down—notably because television receiver sales are growing. In the heavy lines, shipments of electric generating and distribution equipment should be greater this year than last, but sales of equipment used primarily in the industrial and transportation fields will be lower."

White Gets Israeli Truck Order

WHITE Motor Co., Cleveland, has begun work on a $1 million order for heavy trucks for the Israeli government. Shipments have already started and the order will be completed in about 60 days.

GM Bus Unit Furloughs 600

GENERAL Motors Corp.'s GMC Truck & Coach Division laid off 600 at its Pontiac, Mich., plant last week because of drop in demand for busses.

Auto Battery Demand Gains

DEMAND that threatens to outrun production is being experienced by this country's automobile storage battery industry, says Royce G. Martin, president of Electric Auto-Lite Co., Toledo, O.

Sales in June were 44 per cent greater than the average of the preceding five months, and the rising trend continued in July, he declares. Major reason for the sharp upturn in demand is the return to the normal seasonal flow of sales in the battery industry.

American Brake Shoe Shuts Plant

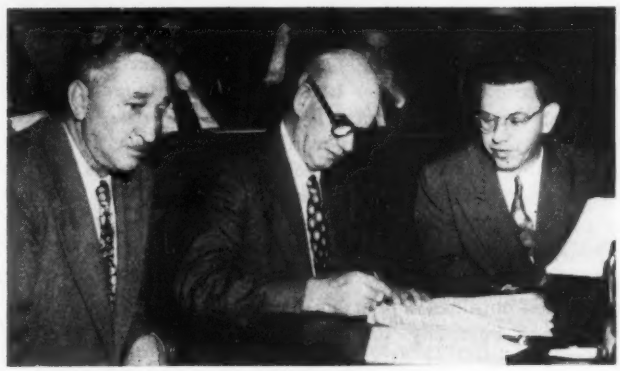
AMERICAN Brake Shoe Co. has permanently closed its railroad car wheel plant at Atlanta. Last February its car wheel plant at Sayre, Pa., was also shut down.

The company is in the process of acquiring a war plant at Tonawanda, N. Y., from the government at a cost of $655,000. The railroad special trackwork production of the Hillburn, N. Y., plant, originally built in 1880, and of the Niagara Falls, N. Y., plant, originally built in 1900, will be transferred to Tonawanda. The Niagara Falls facility will be sold and the Hillburn unit will probably be used for other production.

GM Sales, Profits Climb

FOR EVERY one of the 63 working days in the second quarter of this year, the world's biggest business, General Motors Corp., realized net sales of over $25,323,000, yielding a daily profit of better than $2.6 million. Dollar sales for the three months were nearly $1.6 billion, largest for any quarter in the corporation's history and at an annual pace of better than $6 billion.

Management representatives, shown in the left photo, who are attending the conference of the steel fact-finding board in New York are, left to right: T. F. Patton, vice president and general counsel of Republic Steel; John Stephens, vice president of U. S. Steel; and John Gall of



Youngstown Sheet & Tube. Shown in the other photo are the labor representatives, left to right: James C. Thimmes, vice president of United Steelworkers of America; Philip Murray, union president; and Arthur J. Goldberg, union lawyer

Steel Men To Argue Wage Increase Is Against Public Interest

Union's demand for 30-cent package would mean $10 to $12 a ton increase in steelmaking costs and necessitate price boost, say industry representatives

STEEL producers next Thursday will begin to tell the special steel fact-finding board why they believe the wage increase and social security provisions asked by the United Steelworkers-CIO would be against the public interest.

In the walnut-paneled, air-conditioned hearing chambers in the U. S. Court House in Foley Square, New York, the industry representatives will lay before the panel evidence that steel wages have kept well ahead of living costs over the past 10 years.

They will show how increases of the dimensions asked by the union would increase steelmaking costs by $10 to $12 a ton and necessitate a steel price increase at a time when the economy definitely requires a decrease.

Union Argument—The United Steelworkers' presentation was concluded last week. Union spokesmen asked for a package increase which they estimated would cost 30 cents an hour. The proposal includes a 12½-cent wage increase, pensions of $125 a month at age 65 estimated by the union to cost 11.25 cents an hour, and social insurance estimated by the union to cost 6.27 cents an hour.

In effect, the union witnesses told the board that the steel industry is making lots of money and can afford to pay these demands. The workers, they said, want a wage increase and consider present social security provisions inadequate.

The Nathan report (STEEL, July 18, p. 55) and economic studies prepared by the union's own researchers were the basis for the union's presentation.

Dice Loaded?—Few industry executives expect that the board's recommendations to be sent to the President at the end of August will be unfavorable to the union. Privately, many believe the board will recommend a moderate wage increase, possibly an immediate enlargement of social insurance programs and a suggestion that industry and the unions jointly study the pension problem.

New Pattern — Some industry men believe that free collective bargaining will have been dealt a death blow if the union wins any considerable increase through the fact-finding board's recommendations. Once a precedent is established, they believe, labor will be more inclined to run to a friendly government for help in obtaining wage increases rather than battle the issue out at the bargaining table.

Especially concerned over the outcome of the steel wage dispute are the thousands of metalworking companies which are not parties to the present dispute but which may be caught in a double squeeze play if the unions gain a substantial increase. Once the steel dispute is resolved, the pressure will be applied by the unions to gain similar concessions from these companies, thus raising their costs.

If the steel labor costs go up, any reduction in steel prices will become more remote. Possibly, the wage settlement will require an upward adjustment.

Meanwhile, a number of metalworking companies have reduced their prices to remain competitive. This autumn they may face higher labor costs, with no lower and possibly higher materials costs. Meanwhile, buyers will have been led to expect still lower prices.

Pension Cost Estimates Low—Independent actuaries raise their eyebrows at the union's estimate of the cost of $125 a month pensions. Experience of companies with pension plans indicates that the cost of retirement allowances of this size would be far greater than the 11¼ cents an hour which Murray Latimer, the union's pension consultant, figures.

Some observers believe that President Philip Murray of the United Steelworkers is borrowing a page from the book of John L. Lewis. When the miners' welfare fund was set up, it was estimated that it could be financed with a 10 cents a ton levy on coal mined. Later, the royalty was doubled, to 20 cents a ton. But outlays still exceed income, and actuaries say that about 49 cents a ton would be required to keep the welfare fund sound.

If the steel and metalworking industries can be persuaded to grant $125-a-month pensions on the basis of union estimates of a cost of 11¼ cents an hour and later find the actual cost to be 30 or 40 cents an hour, these observers ask, who is going to pay the difference?

Weirton Negotiations Open

NEGOTIATIONS are under way between the Weirton Independent

Union and the Weirton Steel Co. for a wage increase, liberalization of the existing retirement plan, hospitalization, insurance and other benefits.

Union has a continuous contract with the company that permits reopening at any time for negotiating any phase of wage or other working improvements.

Current basic wage rate at Weirton is $1.265 per hour. In January the union obtained a pension program from the company providing minimum payments of $100 a month for eligible employees, workers receiving pensions at the age of 65 if they desire to retire then.

Parkersburg Steel Struck

PLANT of the Parkersburg Steel Co., Parkersburg, W. Va., was closed by a strike Aug. 1 because the company refused to join in the current fact-finding wage hearings being held in New York.

The Parkersburg company, which employs some 450 men, maintains that since it is not a basic steel producer it should be considered from the standpoint of a fabricator. The company purchases semifinished steel and fashions it into finished products, including stove pipe. The plant lately has been operating four and five days weekly.

Ask Full Pay Pensions

PENSIONS equal to the full annual pay of workers are being asked by the Progressive Steelworkers Union-independent from Wisconsin Steel Works, a division of International Harvester Co. The union wants retirement pay at age 60 to be equal to the average for the highest 10 consecutive years for workers with 20 years or more service. Workers with 10 years of service would receive half their full annual pay for the highest five consecutive years, under the union proposal.

Union also is asking for a "substantial" wage increase and a health insurance program.

Contract Extended

CONTRACT between Allegheny Ludlum Steel Corp. and the United Steelworkers-CIO, scheduled to expire Aug. 16, has been extended to Oct. 15, or 30 days after the truce between the union and other basic steel producers expires.

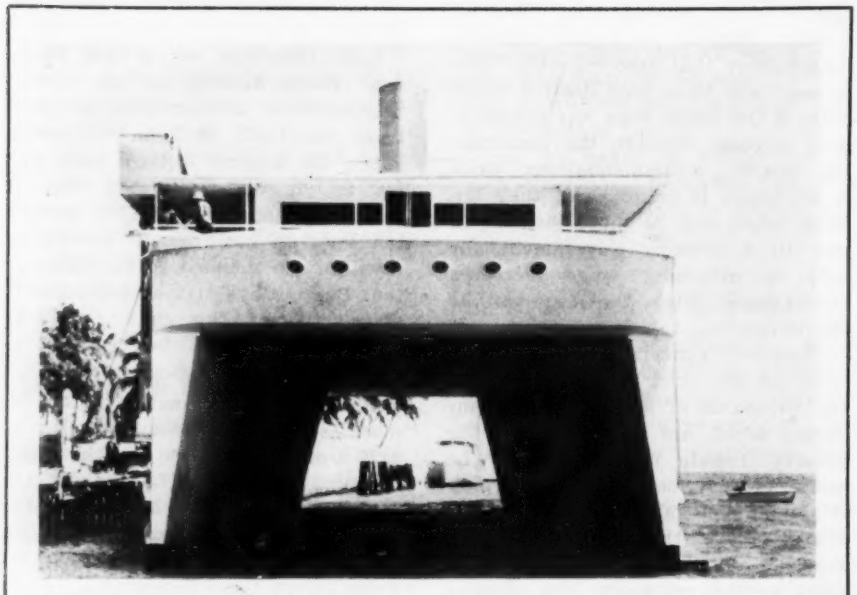
Contributory Plans Gain

A STRONG trend toward employee contributions in group insurance plans is revealed by a National Industrial Conference Board study. More than three-fourths of group insurance plans now require contributions from workers. Four years ago, employers paid the entire bill in nearly half the plans in force.

Whether employees should contribute to insurance and pension programs is a point in dispute in current labor negotiations. Unions generally are asking that companies bear the entire cost. Many employers and insurance and pension specialists believe that employee contributions are advisable.

During the war years, the board finds, noncontributory group insurance plans were popular: Premiums could be deducted from tax returns and the cost of insurance to employers was relatively low. Insurance plans often were installed as a substitute for wage increases, which were controlled by the federal government.

Return to more normal conditions and higher cost of insurance and pension program now being asked have reversed the trend toward noncontributory plans.



TWIN HULLS: Speedboat designer and manufacturer Gar Wood has made public his latest design for ocean going vessels. The twin hulled yacht, *Venturi*, is said to be able to ride the roughest water and still maintain even keel. Mr. Wood predicts it is the coming thing in large passenger ships

Unemployment Rises

But jobholders and total labor force also increase slightly in July over June

UNEMPLOYMENT jumped by 300,000 from June to July to a postwar high of 4,095,000, Census Bureau estimates. Jobholders also gained slightly, from 59.6 million to 59,720,000, and the total labor force—all jobholders and seekers—numbers 63,815,000 now.

Rise in unemployment is attributed partly to the entry of new high school and college graduates into the labor force, but re-entry of older workers accounted for most of the gain, Census Bureau reports. Wives of men on a shorter work-week may be seeking to supplement family incomes. In June only 48,324,000 of the 59.6 million workers were on the job 35 or more hours a week. About 7,377,000 were in the 15-34 hour group, and 1,753,000 worked 1 to 14 hours weekly. This totaled 15.3 per cent of the laboring population on less-than-full-time employment.

Total employment in July was nearly 2 million below the level in the like month a year ago and joblessness was correspondingly higher. While agricultural employment is somewhat higher this year than last, the number of nonfarm workers has dropped by 2.4 million.

Breakeven Point Low

PRESSED Steel Car Co. Inc., Pittsburgh, has instituted a shut-down plan at its carbuilding plants in McKees Rocks, Pa., and Mt. Vernon, Ill., which permits a profit until operations are pared to a low level. The McKees Rocks unit can function profitably until all work has stopped.

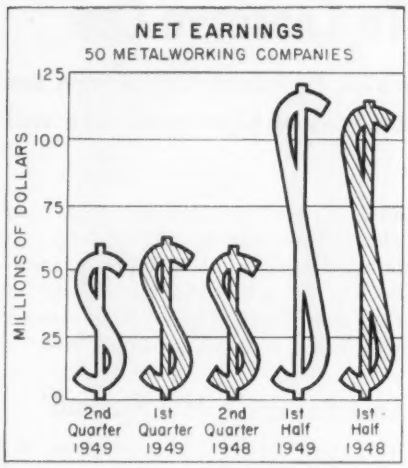
Pressed Steel Car, like other builders, has received virtually no new freight car orders from railroads during the past six months.

Drop in Earnings Slows

Metalworking industry's income declines but descent is less sharp than in first quarter

DOWNTREND in the metalworking industry's earnings continued in the second quarter of 1949 but the rate of descent was considerably less sharp than that which marked the first quarter.

STEEL's accompanying compilation shows 50 representative metalworking companies had total net income of $58,269,763, a decline of 8 per cent below their first-quarter aggregate of $62,765,710. In contrast, a similar compilation three months ago showed the 1949 first quarter performance dipped approximately 27 per cent below the earnings in the fourth quarter of last year.



There is little difference between the 50 companies' total net income in the 1949 second quarter and the 1948 second quarter, the sum for the latter being $57,735,652.

Despite the recent downtrend in earnings, the performance in the 1949 first and second quarters—particularly in the first quarter—was sufficiently better than in the corresponding periods of last year to boost the total net income of the 50 companies for the first half of 1949 to $121,035,473, compared with $115,349,917 for the first half of 1948.

The overall decline in the 1949 second quarter produced lower net income for 30 companies that period than in the first quarter. In addition, four companies reported net losses for both the first and second quarters. Although the aggregate for the first half of 1949 was above that for the first half of 1948, 28 of the companies earned less in the 1949 half and four lost money.

Net Earnings in Metalworking Industry

	2nd Qtr. 1949	1st Qtr. 1949	2nd Qtr. 1948	1st Half 1949	1st Half 1948
Airway Electric Appliance Corp.	$ 306,928	$ 253,387	$ 332,118	$ 560,315	$ 615,818
Allis-Chalmers Mfg. Co.	4,999,445	4,877,983	3,793,723	9,877,428	6,306,658
American Brake Shoe Co.	1,236,373	1,466,722	1,144,064	2,703,095	2,120,070
American Machine & Metals Co.	66,970	28,469	88,018	95,439	245,448
American Radiator & Standard Sanitary Corp.	2,359,000	3,742,000	5,142,312	6,101,000	10,053,698
American Stove Co.	643,557*	608,101*	202,457*	1,251,658*	32,767
Autocar Co.	189,872*	89,976*	37,845	279,848*	199,762
Baldwin Locomotive Works	910,992	918,635	947,928	1,829,627	1,618,118
Blaw-Knox Co.	1,026,882	925,976	1,008,925	1,952,858	1,793,169
E. W. Bliss Co.	357,211	403,733	1,033,819	760,944	1,667,469
Briggs & Stratton Corp.	709,201	773,385	815,141	1,682,586	1,687,701
Budd Co.	3,499,438	3,816,588	2,258,245	7,316,026	5,115,943
Caterpillar Tractor Co.	3,843,231	4,796,621	1,084,255*	8,639,852	1,841,071
Chapman Valve Mfg. Co.	799,570	490,486	400,883	1,290,056	645,603
Clark Equipment Co.	640,945	1,279,941	1,186,111	1,920,886	2,449,193
Cleveland Graphite Bronze Co.	569,267	1,052,180	567,451	1,621,447	1,089,888
Cutler-Hammer Inc.	351,414	603,382	901,459	954,796	1,573,229
Detroit-Michigan Stove Co.	110,825	55,204	616,816	166,029	1,265,160
Diamond T Motor Car Co.	38,793	97,494	372,209	136,287	729,841
Doehler-Jarvis Co.	1,609,059	1,709,614	2,122,563	3,318,673	4,305,716
Eaton Mfg. Co.	1,887,854	2,710,024	2,861,496	4,597,878	5,608,358
Emsco Derrick & Equipment Co.	151,820	539,665	474,908	691,485	807,044
Gabriel Co.	37,672	112,783	162,800	150,455	214,272
Gardner-Denver Co.	649,233	708,434	382,292	1,357,667	754,963
Greenfield Tap & Die Corp.	24,774	106,309	173,277	131,083	349,672
Holland Furnace Co.	1,002,645	390,037*	983,082	612,608	928,182
Houdaille-Hershey Corp.	670,815	724,564	276,878	1,395,379	606,254
International Business Machines Corp.	8,390,795	7,818,310	7,140,280	16,209,105	13,836,161
Kalamazoo Stove & Furnace Co.	150,508*	220,770*	191,242	371,278*	563,661
Minneapolis-Honeywell Regulator Co.	1,102,721	1,341,158	784,487	2,443,879	1,684,670
Monarch Machine Tool Co.	162,700	117,731	146,953	280,431	254,100
Mullins Mfg. Corp.	550,774	748,051	1,581,442	1,298,825	3,113,125
National Acme Co.	316,230	293,866	344,284	610,096	670,536
National Cash Register Co.	2,740,594	3,027,065	3,543,627	5,767,659	6,863,490
National Supply Co.	1,423,762	3,060,277	2,405,056	4,484,039	3,642,979
Pressed Steel Car Co.	962,281	564,600	404,074*	1,526,881	666,493*
Reed Roller Bit Co.	419,309	470,218	538,958	889,527	1,023,001
Rheem Mfg. Co.	580,905	563,500	840,296	1,144,405	1,571,033
Simonds Saw & Steel Co.	231,784	695,119	871,625	926,903	1,605,279
Square D Co.	754,059	838,570	822,587	1,592,629	1,726,644
Studebaker Corp.	6,517,131	5,207,800	3,874,706	11,724,931	8,126,553
Thompson Products Inc.	1,624,573	996,950	1,253,163	2,621,523	2,397,847
Thor Corp.	233,053	131,522*	589,389	101,531	1,428,052
Trane Co.	291,691	415,910	318,868	707,601	777,229
United-Carr Fastener Corp.	432,401	504,734	380,501	937,135	781,892
U. S. Hoffman Machinery Corp.	99,665*	124,728*	112,255	224,393*	231,492
Victor Equipment Co.	57,271	57,283	49,235	114,554	140,631
Westinghouse Air Brake Co.	3,294,227	3,795,627	4,136,887	7,089,854	7,941,292
Weston Electric Instrument Corp.	80,265	146,788	194,422	227,053	392,945
Worthington Pump & Machinery Corp.	1,126,482	1,473,708	1,221,812	2,600,190	2,618,731
Totals	$58,269,763	$62,765,710	$57,735,652	$121,035,473	$115,349,917

* Net Loss.

New Sintering Plants To Conserve Ore

U. S. Steel building five to recover flue dust, utilize iron ore fines. Equivalent of 1.8 million tons of high-grade ore will be reclaimed annually

CONSTRUCTION of five plants to process powdery iron ore to usable size and to recover iron from blast furnace flue dust is being undertaken at strategic centers by steelmaking subsidiaries of United States Steel Corp.

Completion of the facilities will add some 1.8 million net tons a year to the high-grade iron ore available for U. S. Steel's blast furnaces without requiring an increase in iron mining.

Large sintering plants of the most advanced design will be built at the Gary, Ind., and South Chicago, Ill., plants of Carnegie-Illinois Steel Corp., and at the Edgar Thomson and Carrie Furnace plants of that company in the Pittsburgh district. Another sintering plant will be installed at National Works of National Tube Co. at McKeesport, Pa.

Recover Iron from Flue Dust—The new sintering plants will recover the substantial quantities of iron present in flue dust and sludge recovered from the dust catchers and gas washers at the blast furnaces. Flue dust has an iron content of approximately 50 per cent.

The new iron recovery program of U. S. Steel will conserve reserves of direct-shipping ores and provide blast furnaces in the Pittsburgh and Chicago districts with a charge of material of higher iron content than that of the ore as mined, and of superior physical properties. Completion of the new plants thus will conserve high grade iron ore reserves of U. S. Steel and facilitate use of a moderate proportion of lower grade ores without interfering with efficient and economical operation of the blast furnaces.

Prevents Loss of Ore—The importance of these facilities is apparent from the fact that over a period of ten years a metallic loss of approximately 3 million tons can be traced to the presence of fines in iron ore. This loss, when translated into an equivalent amount of ore, equals just about the ore requirement of one 900-ton blast furnace.

Plants of U. S. Steel are already equipped with ten sintering plants to process flue dust recovered from blast furnace gas into "sinter." Production from these plants during 1948 was at a rate of about 3.4 million tons of sinter per year. But more dust is recovered currently at steel plants than can be sintered by existing machines, resulting in accumulations of substantial quantities of flue dust. Utilization of these stocks will lessen demand for mined ore.

Cold Reduction Mill Planned

THOMAS STEEL CO., Warren, O., plans to spend $1.2 million to install a tandem cold reduction mill. Directors have authorized expenditure from the company's property account which has been building up for years.

Milton E. Barber, president, said the mill will add about 2000 tons of cold-rolled products monthly and will replace equipment installed between 1924 and 1934. New unit should be installed by April, 1950, although no builder has yet been disclosed.

Open Hearths Near Completion

FIVE open hearths at the Niles, Calif., plant of Pacific States Steel Corp. are rapidly nearing completion. Expansion will bring yearly ingot production to about 250,000 tons. The mill is producing now at a 400-ton daily rate.

The company is also adding a new rolling mill for production of rounds, I beams, wide flanges and structural angles. This diversification will absorb the increased open-hearth production and widen the company's market in the West.

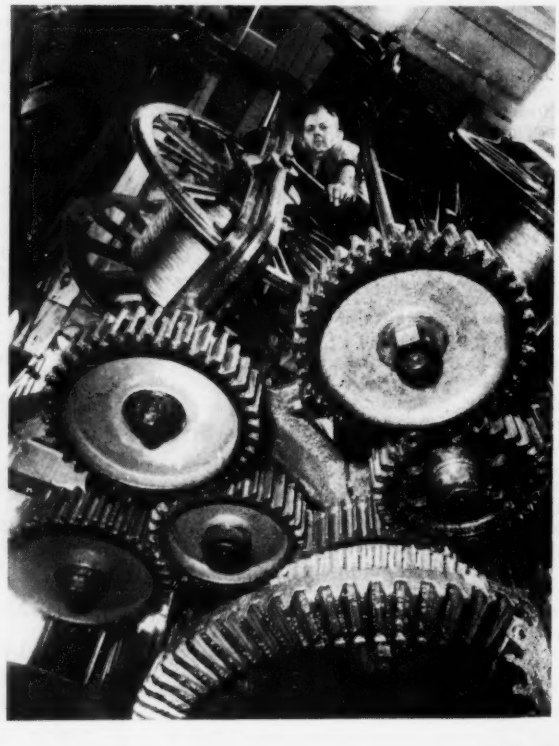
Ingots also will be channeled to a plant being constructed by American Forge Co., adjoining the Pacific States mill. American Forge has been located in Berkeley, Calif. New forges, presses and other equipment will make the plant at Niles one of the most modern on the Pacific coast. Its products include steel ring, marine and diesel forgings, stamp mill shoes, dies, and drop, carbon and alloy forgings.

John Eastwood Jr. is president of Pacific States and American Forge. He is general manager of the former. General manager of American Forge is M. G. Spaich, who is vice president and manager of sales of Pacific States.

International in Railroad Supply

NEXT ORDER of business for International Steel Co.'s Evansville, Ind., plant is expansion into the railroad supply field. A large fabricator of steel, the company will produce boxcar doors, freight car sides and underframes, brine tanks, stainless steel floors and braces and panels for refrigerator cars. Scheduled for fabrication, too, are section buildings for oil storage depots, shops and service buildings.

Earl F. Nystrom, designer of the



WIRE MAKER: This 10-ton vertical layer machine in the plant of American Steel & Wire Co., U. S. Steel Corp. subsidiary, at Trenton, N. J., operated by the man at the top, is making 20 miles of wire rope for elevators in the UN Secretariat Building in New York. NEA photo

train, "Hiawatha," and Frank E. Cheshire, former vice president of the Missouri Pacific railroad, have been added to the staff to assist in the expansion program.

Nash Expands Two Plants

BUILDING expansion program at the Milwaukee and Kenosha, Wis., plants of Nash-Kelvinator Corp., costing $2 million, will involve construction and equipping of two new buildings for added Nash manufacturing facilities. Addition to the Milwaukee body plant will provide 130,556 more sq ft of floor space; the Kenosha expansion adds 88,000 sq ft to a motor assembly building. The new areas bring total Nash manufacturing to 4,593,326 sq ft, not including research laboratories or proving ground.

Tinnerman Begins Construction

TINNERMAN Products Inc., Cleveland, will begin immediate construction of a $1.5 million plant in nearby Brooklyn Village with completion scheduled for June, 1950. The company's present plant is too small to accommodate the growing demand for Speed Nut fasteners.

New plant will give Tinnerman an additional 150,000 sq ft of manufacturing and office space. It is designed to incorporate the proper grouping of departments, most efficient in-line production arrangements and also has room for additional expansion.

Atom Power Plant Contract Let

CONTRACT for $1,690,637 to erect the main laboratory and office building of Westinghouse Electric Corp.'s Atomic Power Division at the Bettis Field site in Pittsburgh has been awarded to Ragnar Benson Inc., Chicago. The building will house an important share of work now being carried on by Westinghouse to construct an atomic power plant for Navy ship propulsion. In this project Westinghouse is working under contract with the Atomic Energy Commission and in co-operation with the Argonne National Laboratory, major center of the commission's "nuclear reactor" development program.

Building is slated for completion in 290 days. Of masonry and steel construction, the combination one and two-story structure will contain 130,000 sq ft of floor space.

General Petroleum Builds

CONSTRUCTION has been started by General Petroleum Corp. on a $2,250,000 expansion program at its Torrance, Calif., refinery. Project involves equipment changes which will enable the plant to turn more of its surplus heavy fuel oil into other petroleum products which are in greater demand.

Observers in the oil industry believe this may signal similar refinery modification programs on the part of other major producers. If so, purchases of equipment and materials could be substantial.

General Petroleum's program will add more than 50 per cent to the Torrance refinery's capacity to squeeze out the valuable light hydrocarbons contained in fuel oil, leaving only gasses and solid coke.

WALTER J. CAMPBELL

WILLIAM M. ROONEY

TO PROVIDE a more highly specialized treatment of news and market information in STEEL, Walter J. Campbell has been appointed news editor and William M. Rooney market editor.

Mr. Campbell, a graduate of Ohio Wesleyan University, has been an associate editor of STEEL since 1937, and before that served nine years as an Ohio newspaper reporter and editor. He will have overall responsibility for the magazine's news and market coverage.

Mr. Rooney has been associated with STEEL and other Penton publications since 1918. For many years he was managing editor of *Daily Metal Trade*.

Steel Exports, Imports Decline

DECLINES were registered in both exports and imports of iron and steel during May. Commerce Department totals show May exports about 32,000 tons below April and imports about 37 per cent of the preceding month total.

May exports aggregated 447,472 net tons and imports were 11,613 tons, compared with April totals of 479,366 and 31,539, respectively. Although scrap imports were up slightly in May to 127,679 tons from 118,839 in the preceding month, both months are well below the first quarter average of 200,000 tons per month. A large percentage of the incoming scrap was contracted for during the period when scrap was tight. Downtrend in scrap imports should continue as most contracts for foreign scrap are not being renewed.

Ferrous exports in May and April, by principal categories, were:

(Net Tons)

	April	May
Semifinished	47,562	30,937
Iron and steel bars	46,169	50,795
Sheet and plates	187,792	168,468
Structural shapes	45,021	55,304
Railroad supplies	35,415	29,223
Tubes, pipe, fittings	86,071	76,440
Wire products	24,387	29,011
Nails, other fasteners	6,949	7,294
Total	479,366	447,472
Pig iron, ferroalloys	11,198	27,907
Scrap	36,961	57,675

Commerce Department's breakdown of imports for April and May was:

(Net Tons)

	April	May
Ingots, etc.	2,574	1,340
Wire rods	539	353
Iron bars, slabs	46	115
Reinforcing bars	1,671	45
Hollow bar, drill steel	6	22
Other bars	3,196	46
Boiler, other plate	4,558	3,085
Sheets, etc.	3,590	1,771
Tin plate, etc.	24	9
Other hoops, bands	619	15
Structurals, piling	13,032	2,771
Rails, fastenings	75	211
Wheels, axles	46	....
Pipe, tubes	943	1,434
Round wire	1	....
Flat wire, strip	200	149
Telegraph wire	....	93
Wire rope	24	21
Nails, etc.	381	119
Bolts, nuts	6	4
Castings, forgings	8	4
Die blocks, blanks	....	6
Total	31,539	11,613
Pig iron	2,488	6,161
Sponge iron	253	164
Ferromanganese	8,470	11,416
Ferrosilicon	44	124
Ferrochrome	805	477
Scrap	118,839	127,679

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Packaged highway program costing more than $11 billion slated for congressional attention next year. Structural requirements extensive

FEDERAL-AID highway legislation promises to be a hot subject for attention of Congress next year—not only because of the great need for highway improvement but because highway construction is a means of affording large-scale relief of unemployment. To get at the highway problem in one package in 1950, congressional leaders tentatively have agreed to hold off action on legislation that has been under consideration during this session. Temporarily pigeonholed are bills under which Uncle Sam would ante $150 million a year toward the improvement of local roads and authorization of six coast-to-coast super highways at intervals from north to south.

Instead of this piecemeal approach, the program to be considered next year will focus on the need for improvements in the interstate highway system—comprising 40,000 miles of highway connecting 182 of the 199 cities having a population of 50,000 or more—and the need for improving local and farm-to-market roads. Most of the basic data for next year's legislation are at hand in a report on the interstate highway system recently completed by the Public Roads Administration and in testimony developed by the Senate Public Works Committee on this year's local roads bill.

Defense Needs—"Highway Needs of the National Defense" is the title of the report on the interstate highway system—a 176-page document compiled in co-operation with state highway departments, the National Military Establishment and the National Security Resources Board. To get this system into shape, the report says, requirements would be $11.3 billion at 1948 costs. While a long range program is visualized, the inference is that the sooner all this work is done the better off the country will be by speeding up vehicular traffic and greatly reducing the accident rate.

Considerable business should result for the steel and metalworking industry. Report suggests that the number of roadbuilding machines and allied apparatus required will be large.

Structural Requirements — Size of the market for reinforcing bars and mesh, culvert pipe, bridge steel, steel piling, etc., that will be opened up is suggested by these facts: 1. Of the total of 40,000 miles, 2200 miles of highway requiring 4893 bridges still are to be built. 2. Of the 37,800 miles in existence, 11,891 miles require relocation. 3. Of the 12,048 bridges now in the system only 1607 have capacity for a gross load of 72,000 pounds over a length of 28 feet, and the great majority are inadequate in width; 1245 wooden bridges will have to be replaced by steel, reinforced concrete or masonry structures. 4. Of tunnels in the system 21 are inadequate in one or more respects. 5. An indefinite number of elevated steel structures are needed to carry traffic safely and speedily through cities.

RFC-Approved Loans

LOANS approved by the Reconstruction Finance Corp. during June include:

Central Iron & Steel Co., Harrisburg, Pa., manufacturer of steel plates and prefabricated plate parts, $4.7 million for five years, for construction and machinery and equipment.

Pacific States Steel Corp., Niles, Calif., producer of merchant bars and shapes, $575,000 for two and a half years, for construction and working capital.

Daybrook Hydraulic Corp., Bowling Green, Ky., hydraulic hoists and other such equipment, $500,000 for five years, for working capital.

Lustron Corp., Columbus, O., prefabricated metal homes, $1 million for 60 days, working capital (with another $1 million advanced in July, total RFC loans to Lustron are $34.5 million).

Warsaw Elevator Co., Warsaw, N. Y., passenger and freight elevators, $600,000 for five years, working capital.

Segal Lock & Hardware Co. Inc., New York, hardware and key duplicating machines, $1,750,000 for five years, machinery and equipment and working capital.

Reliance Homes Inc., Lester, Pa., prefabricated steel and aluminum homes, $3,839,000 for two years, for working capital and some machinery.

Unexcelled Chemical Corp., New York, paints, varnishes, metallic powders, chemical and pyrotechnic products, $525,000 for five years, working capital.

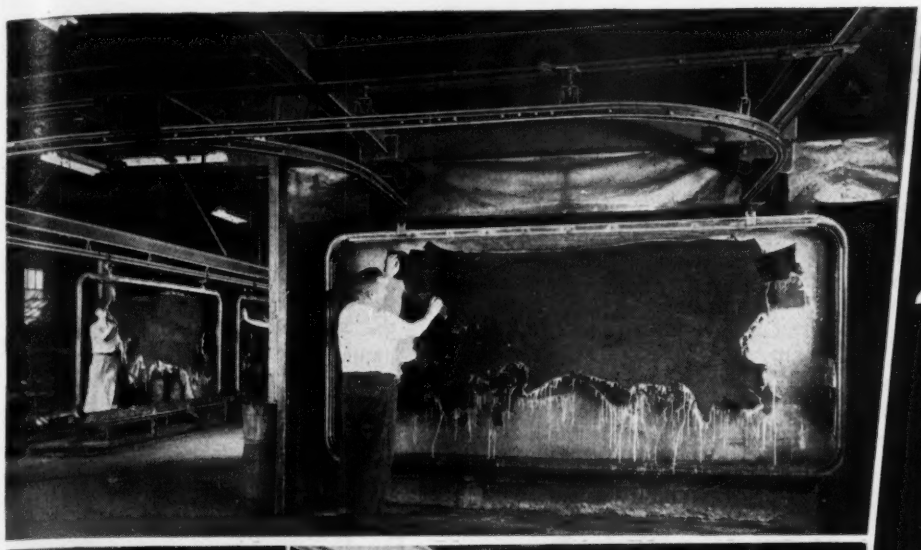
ATTORNEY GENERAL: J. Howard McGrath, senator from Rhode Island and chairman of the Democratic National Committee, named to fill the post being vacated by Tom Clark. Senator McGrath's background includes service as U. S. Attorney for Rhode Island, governor of that state, and U. S. Solicitor General

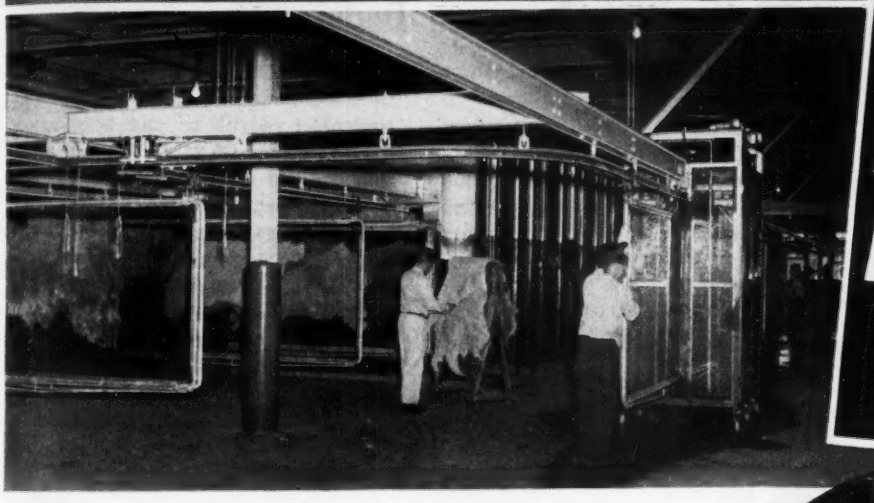
RFC Hiring May Be Limited

UNDER a Senate-passed bill now awaiting House action, borrowers of funds from the Reconstruction Finance Corp. would have to agree not to give employment to any RFC personnel having discretionary power with respect to loans. The agreement covers a period two years from the date of the loan, and also applies to anyone who has been an RFC employee with discretionary loan power within one year prior to the loan date.

Air Board Ready for Contracts

AIR NAVIGATION Development Board set up last fall to co-ordinate control of civil and military air traffic, to formulate civil air defense techniques and to pave the way for eliminating, or greatly reducing, the possibilities of aviation accidents, is approaching the stage of letting contracts. These will call for research and development work with the ob-





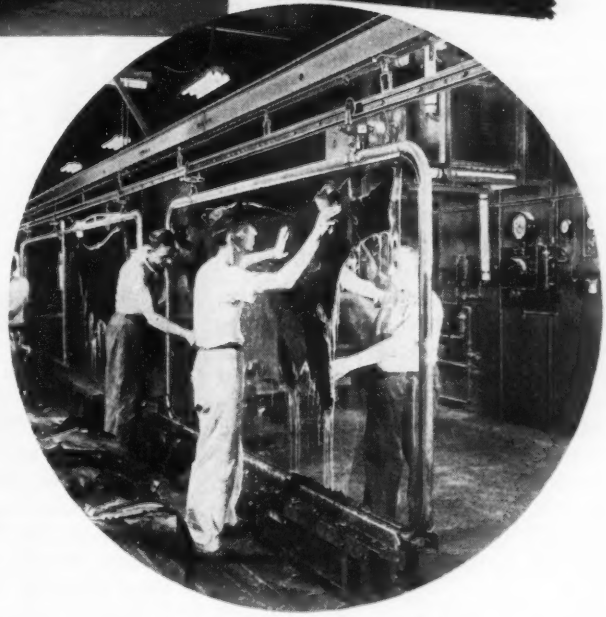
Faster Drying with AMERICAN MONORAIL

Here's a simple MonoRail loop with carriers and "kicker" switches that really speeds up leather drying.

Sides or skins are pasted on glass plates in carrier frames suspended from a MonoRail track; all unnecessary manual handling is eliminated. After the wet leather is pasted on glass, the carrier moves through the dryer without rehandling and the dried leather is stripped from the glass plate for further processing.

An automatic switch transfers the carrier from single to double line travel through the dryer. After the leather has been removed, the carrier is automatically transferred from double to single line travel through the plate washer and pasting stations.

This is just another example of the simplicity of MonoRail application that most economically correlates transfer and processing operations. An American MonoRail engineer can show you how you can increase production and lower costs with American MonoRail Overhead Handling.



Photographs through courtesy of Proctor and Schwartz, Inc.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE CLEVELAND 7, OHIO

ject of creating automatic traffic control systems involving the use of suitable equipment—mostly electronic—on the ground and in the air.

Program calls for expenditure of $7 million in the present fiscal year and a total of $70 to $80 million over the next 15 years. Estimation is that after the ANDB develops and approves automatic methods and equipment fully $1 billion worth of such equipment will be purchased.

Research by Industry Urged

RESEARCH and Development Board, National Military Establishment, believes insufficient research and development work is being done in the United States. The board's views are:

"In the continuing review of research and development in the United States, within and outside the Military Establishment, the Research and Development Board has uncovered a number of important gaps which should be filled. Those which are properly the responsibility of the Armed Services are being brought to the attention of the military departments.

"It is hoped that industry will take the initiative in filling those gaps which are fundamentally of civilian interest. The participation of industrial experts in the work of the Research and Development Board through membership on its committees and panels provides industry the opportunity to see and to anticipate those areas where research and development could be profitably and effectively sponsored by private enterprise."

To Close Clayton Act Loophole

FAVORABLY reported by the House Judiciary Committee is the bill prohibiting acquisition of the assets of a company where such action would tend to lessen competition substantially or create a monopoly. It would close a loophole in the Clayton act. The bill was favorably reported by the Judiciary Committee in the 79th and 80th Congresses but never came to House vote.

Technical Assistance Continues

ECA will assist in bringing about 50 British engineers to the United States for one year of graduate study in leading technical schools and on-the-job training in factories to learn American production methods. Training project is part of ECA's technical assistance program. There are not enough facilities for training technologists in Britain, so engineering schools of all types and U. S. plants will serve as training ground for the men.

Broader Diesel Statistics Needed

DIESEL engine manufacturers are working with the Department of Commerce in an effort to get the Bureau of the Census to broaden its statistics to show domestic production and exports in greater detail. Object is to have a more comprehensive breakdown of sizes by horsepower or piston displacement.

Builders of diesel engines report keener competition from European manufacturers who are seeking business aggressively on the contention that they are the pioneers in the diesel engine field and the leaders in "know-how."

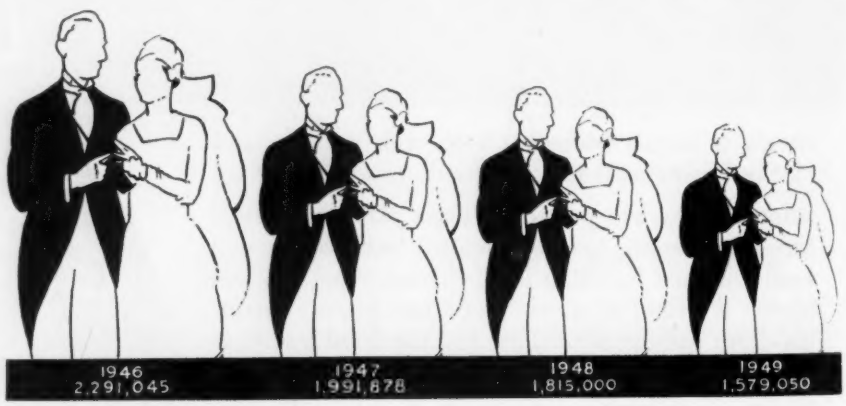
Utility Directory Available

A WIDELY useful new volume entitled "Directory of Electric and Gas Utilities—1948" now is available from the Federal Power Commission, Washington 25, D. C., at $5; the order number is FPC S-69. It lists the 3866 electric and 1063 gas companies in the United States and its territories by names and addresses, and it gives such details as names of directors, name of controlling company, description of services rendered.

Marriage, Birth Rates on Decline

LATEST vital statistics of the Public Health Service are significant to manufacturers because they show marked declines in both the marriage and birth rates. Indications are these declines will not be arrested soon, so manufacturers of products going into homes face the prospect of fewer customers.

At least a part of the size of steel's stake is indicated by recent studies of the American Iron & Steel Institute which reports that an average-sized new home contains 9800 pounds of steel—7700 pounds in the form of nails, flashings, pipes, hinges, hardware, etc., and 2100 pounds in the furnace, refrigerator, kitchen range, sink and dozens of other products.



Indicate Drop in Housing—Public Health Service figures indicate there should be fewer new homes in the next few years. From the all-time high of 2,291,045 marriages in 1946, there was a decline in 1947 to 1,991,878. Best estimates indicate further declines to 1,815,000 in 1948 and 1,579,050 in 1949.

Falling off in marriages is largely due to the business depression of the '30s. Fewer children were born in those years; now there is a proportionately smaller number of marriageable youths in the population. From a range of 21 to 24 births per thousand of population in the '20s, the birth rate fell to 16.7 in 1936. Inasmuch as most girls marry at ages 18-23 inclusive, the effects of the reduced birth rate of the '30s started to be felt last year and will continue to be felt in the form of a reduced number of marriages until 1958 or 1959.

Market Shrinks—For manufacturers of baby carriages, safety pins and related products the current birth statistics are not much more encouraging. The 1947 baby crop—an all-time record—was 3,699,940. For 1948 the preliminary estimate is 3,559,000 while, on the basis of 1,140,000 in the first four months of 1949, this year's births should total about 3,420,000.

The trend set forth above makes no allowance for business conditions that lie ahead, but the general rule is accentuation or diminution of a declining trend as the business curve tends downward or upward. If business continues to recede prospects point to fewer marriages and births.

Intra-European Trade Efforts Mount

In addition to ECA help, Marshall Plan nations look to industrial fairs, standardization and new drives for markets to break the log jam in commerce

EUROPE is not depending upon ERP or ERP-sponsored programs alone to break up the log jam in intra-European trade.

Deepening disappointment has been the reaction to the most recent plan to boost commerce. The British-induced compromise reluctantly agreed to by U. S. Marshall Plan officials bans free convertibility into dollars or gold for another year and permits only limited availability of intra-ERP credits. The compromise, which followed revelation of Britain's economic plight, is termed a mere continuation of barter.

The record number of 25 industrial fairs scheduled in Europe between Aug. 20 and Oct. 17 may serve as a small dynamite charge to nudge trade to freer channels. Major exhibits include a mechanical and nautical industries' showing in London, Aug. 25 to Sept. 4; the Leipzig trade fair, Aug. 30 to Sept. 4; the automoble show in Turin, Italy, Sept. 15 to 26; a Manchester, England, textile machines and accessories exhibit, Oct. 12 to 22; and a business efficiency exhibition in London, Nov. 9 to 19.

Lack of international standardization is a more serious barrier to intra-European trade than language, export-import controls or nationalism, says the International Standardization Organization which held its first full session in Paris last month. The UN-sponsored group tackled the problem of standardization in threads, nuts, bearings, boat construction, diameters, welding and building construction. Universal adoption of the metric system is regarded as the first important step toward international standardization.

The French, in another action independent of ERP, are opening an intensive drive to gain more U.S. markets.

Italy's Fiat Co. is aiming at a greater share of the continent's automobile business with a new line of small, inexpensive models. The firm's $34.3 million retooling, modernization and rehabilitation program will be only partly financed by ERP.

France

PHILADELPHIA Chamber of Commerce is co-operating with any French manufacturer interested in marketing his product in that area. The American Chamber of Commerce in France, another co-operating agency, sees this program as a trial run which may be first in a series of regional efforts to gain more U. S. trade.

France's total foreign commerce deficit still increases and in May stood at $71.5 million compared with $55.7 million in May, 1948. The nation's dollar deficit is much higher; for the five months, November, 1948, through March, 1949, it was $260 million. France is banking on the heavy tourist influx this summer to ease the dollar shortage.

ARCTIC ORE SOON

NAZI-destroyed iron ore mines at Sydvaranger in northern Norway will be operating at full capacity by 1952, producing some 1 million tons of ore for export yearly.

Only a few miles from the Norwegian-Soviet border, the mines are being renovated and modernized from top to bottom. Already $10 milllion in new capital has been invested. New housing and plant buildings are now under construction. This fall, new electric power shovels will be installed and late last month the first of a series of diesel-powered ore conveyors arrived from the United States. Early next year a large ore crusher will be delivered. By 1951 separation plant machinery will be ready for operation.

Italy

FIAT Co., Turin, Italy, will finance about 45 per cent of its modernization program from its own funds. The remainder of the capital will be advanced by ECA and the Export-Import Bank and will be used in the U. S. to purchase foundry machinery, forging presses, sheet processing presses, lathes and other machine tools.

Fiat plans to be on the market near the first of the year with an entirely new type of automobile in four-to-six passenger models and weighing about 2100 pounds. New styling and improved mechanical features are being incorporated in the car. Plastics will be used for door handles, door trim, dash trim and control handles. New paint processes will provide a high gloss luster appearance which has not been obtainable in Italy heretofore.

In addition to automobiles, Fiat makes busses, trucks, agricultural equipment, diesel engines and railroad rolling equipment. The company employs more than 55,000 workers.

Netherlands

INTERNATIONAL Bank for Reconstruction & Development has granted the Netherlands a $15 million loan to be used to finance hard currency requirements of 24 different firms making container glass, household glassware, cement, phenol, sulphuric acid and other chemicals, diesel motors, crankshafts, chains, rubber, cables, transformers, wire, electrical apparatus and other products.

Additional Dutch investment in the projects will be the equivalent of $65 million, of which $18 million has already been spent.

United Kingdom

HOUSE of Lords by a vote of 103 to 29 has blocked the labor government's bill to nationalize the steel industry next May and has insured that the issue will figure in the next general election which must be held before the end of August, 1950.

The effect of the vote is that nationalization cannot become effective before July, 1950. Conservatives pin their hopes on an election victory by that time or shortly after to reverse Labor's stand.

Australia

CRIMP in its dollar balance is forcing Australia again to restrict its imports from dollar areas. In May the commonwealth imported $19,750,000 worth of dollar area products, one sixth of its total imports.

Machinery, metals, fabricated items, including automobile bodies and electrical equipment constitute more than half of Australia's dollar imports, and these are expected to be curtailed soon.

Australia's industrial revolution is hampered by lack of coal. The nation's steel industry could produce

1,750,000 tons of ingots annually, but since 1945 production has averaged about 500,000 tons yearly under capacity because of the coal shortage. The situation has been complicated by a long coal strike. The Communist - dominated Miners' Federation is demanding a 35-hour week, increased wages and expensive fringe benefits.

Work is slowly progressing to establish an aluminum industry at Bell Bay, Tasmania. Part of the equipment will consist of machinery turned over as reparations from Germany to Sweden and sold by Sweden to the Australian Aluminum Production Commission. Bell Bay was chosen as a site because of potential power supplies available and bauxite mines nearby. The area is largely undeveloped. Only two dwellings are now standing, and the first step in the program will be to build workers' homes.

Australian imports of raw and semifabricated aluminum in the fiscal year ended June 30, 1947, totaled 5272 tons, of which 90.7 per cent originated in Canada, 7.8 per cent in the U. K. and 1.4 per cent in the U. S.

More Than 50,000 Metalworking Firms

Census of Manufactures for 1947 reveals the 12,297 companies employing more than 50 account for over 90 per cent of the total labor and business

METALWORKING industry in 1947 included 50,286 firms, employed 5,888,944 workers and added $29,343,012,000 in value from manufacture, Census of Manufactures reveals. The industry's gross production volume for 1947 was $62 billion, compared with $43.2 billion in 1946 and $19.4 billion in 1939.

Value added by manufacture is calculated by subtracting cost of materials, supplies, containers, fuel, purchased electric energy and contract work from the value of products.

Volume Concentrated — Although metalworking companies employing more than 50 workers made up 24.4 per cent of the total number of metalworking firms, they employed 92.3 per cent of the total labor force and accounted for 90.3 per cent of the value added by manufacture in the entire industry. Only 348 companies employed 2500 or more. These firms accounted for 0.6 per cent of the total number of companies, 31.6 per cent of the total labor force and 29.1 per cent of the value added by manufacture. Companies employing less than 50 totaled 37,989, but they accounted for only 7.7 per cent of the labor force and 9.7 per cent of the value added by manufacture.

Bureau of the Census, Department of Commerce, which made the report, divides the metalworking industry into six groups—primary metal industries, fabricated metal products, machinery except electrical, electrical machinery, transportation equipment and instrument and related products. Largest division is the "machinery except electrical" category; smallest is the "instruments and related products" group.

Complete breakdown is shown in the accompanying table.

Industry Title	All establishments	Establishments with an average of— 1-4 employees	5-9 employees	10-19 employees	20-49 employees	50-99 employees	100-249 employees	250-499 employees	500-999 employees	1,000-2,499 employees	2,500 and over employees
Primary metal industries:											
Number of establishments	5,363	843	675	692	1,007	640	681	378	219	150	78
Total employees (avg. for year)	1,157,124	1,922	4,534	9,673	32,158	45,110	110,807	133,949	151,508	234,317	433,146
* Value added by manufacture	$5,765,434	$9,202	$21,368	$41,764	$150,197	$217,572	$617,391	$755,921	$815,250	$1,246,635	$1,890,134
Fabricated metal products:											
Number of establishments	16,734	4,712	3,062	2,713	2,940	1,384	1,115	438	254	98	18
Total employees (avg. for year)	971,461	10,540	20,719	37,518	91,573	96,867	173,619	153,427	172,427	152,362	62,654
* Value added by manufacture	$4,921,476	$54,637	$98,625	$184,721	$466,915	$503,709	$930,950	$797,418	$879,453	$719,550	$285,498
Machinery (except electrical):											
Number of establishments	17,906	5,093	3,339	3,037	2,788	1,341	1,149	547	322	215	75
Total employees (avg. for year)	1,545,323	11,567	22,316	41,772	86,885	93,629	180,950	189,498	226,148	331,936	360,622
* Value added by manufacture	$7,812,455	$62,676	$110,682	$210,861	$466,861	$466,346	$513,032	$989,345	$1,188,055	$1,634,131	$1,616,350
Electrical machinery:											
Number of establishments	3,973	738	543	536	670	448	429	269	178	112	50
Total employees (avg. for year)	801,359	1,766	3,609	7,479	21,110	31,698	67,208	98,954	133,091	179,664	256,780
* Value added by manufacture	$3,894,115	$7,717	$16,273	$33,095	$96,528	$149,531	$326,753	$473,462	$624,822	$886,950	$1,278,984
Transportation equipment:											
Number of establishments	3,711	891	575	493	577	307	318	146	146	143	115
Total employees (avg. for year)	1,181,680	1,967	3,813	6,910	18,298	21,484	51,396	51,378	103,692	224,822	697,920
* Value added by manufacture	$5,869,196	$7,938	$16,000	$29,906	$90,581	$106,498	$261,238	$247,362	$529,811	$1,210,791	$3,369,071
Instruments and related products:											
Number of establishments	2,599	835	435	417	378	195	174	75	75	38	12
Total employees (avg. for year)	231,997	1,846	2,844	5,792	11,812	13,440	27,523	26,063	29,236	58,248	55,093
* Value added by manufacture	$1,080,336	$9,371	$14,063	$29,400	$51,719	$65,764	$126,818	$124,310	$142,504	$258,927	$247,460

* 000 omitted

Steelworks Summarized

VALUE added by manufacture in the steelworks and rolling mills industry for 1947 amounted to $2,276,000,000, Bureau of Census says.

Average employment in the industry amounted to 500,799 in 1947, compared with 413,280 in 1939. Salaries and wages paid to all employees increased 136 per cent, from $675 million in 1939 to $1,594,000,000 in 1947. The industry's expenditures for new plant and equipment during 1947 totaled $318 million.

Steelworks and rolling mills industry comprises establishments primarily engaged in converting pig iron, scrap iron and scrap steel into steel, in hot-rolling iron and steel into basic shapes.

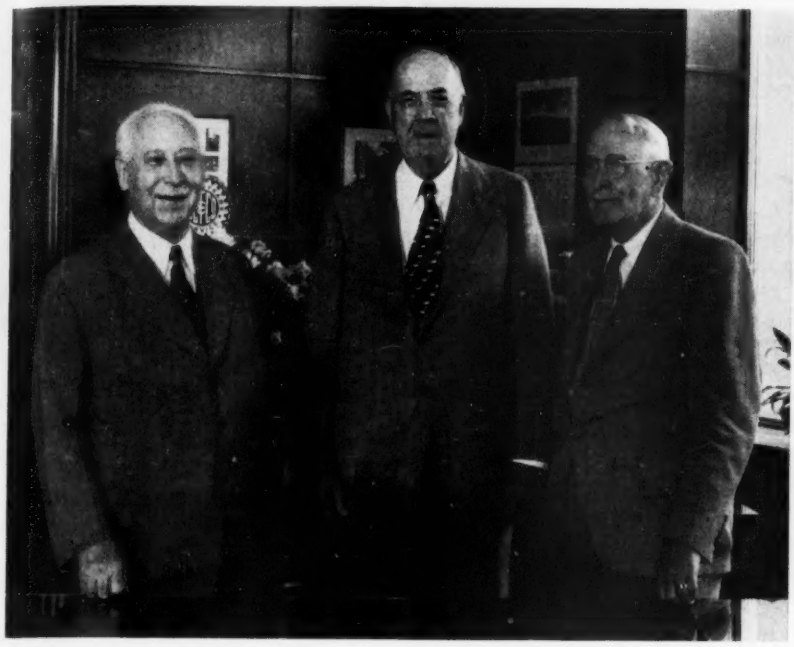
Metalworking Machinery Studied

MANUFACTURERS in the "metalworking machinery, not elsewhere classified" industry shipped products valued at $520 million during 1947, Bureau of Census reports.

This is an increase of 358 per cent over the $114 million value of products reported by this industry in 1939. Value added by manufacture in the industry during 1947 amounted to $303 million, an increase of 313 per cent over the $73 million value added in 1939.

Production worker employment in the industry averaged 43,568 in 1947, compared with 18,123 in 1939. Wages paid to these employees increased 371 per cent, from $28.2 million in 1939 to $132.8 million in 1947. The industry's expenditures for new plant and equipment during 1947 totaled $11.6 million.

The industry comprises establishments primarily engaged in manufacturing machinery for shaping,



VETERANS IN MANAGEMENT: First employees—all members of top management—to complete 50 years of service with United Engineering & Foundry Co. are, left to right: F. C. Biggert, chairman of the board; K. C. Gardner, president; and G. W. Knotts, director and machinery consultant

pressing, forging or bending metal where the shaping action of such machines is not dependent on a cutting tool. Electrical welding apparatus makers are not included in this category.

"Phantom" Orders

Go to 99 cutting tool manufacturers. Call for $74 million in equipment

"PHANTOM" orders for $74 million worth of cutting tools have been issued to 99 companies by the Reconstruction Finance Corp. under the industrial mobilization program of the National Security Resources Board. Orders will become active only when and if RFC tells those companies that national emergency exists. Meanwhile, the companies are expected to make advance preparations to get into production when the go-ahead signal is flashed.

This is the second phantom order program to reach metalworking companies. Earlier, the RFC and the NSRB sent out ghost orders for $750 million worth of machine tools to some 300 builders. The machine tool program now is being revised.

Gage Program Planned—A third program for gages is in an advanced stage of planning. A survey of gage manufacturers' capacity has been completed and work is under way in the preparation of orders.

NSRB has decided not to use phantom orders in the fields of foundry equipment, heat treating furnaces and abrasives at this time. Other mobilization plans, details of which are secret, have been prepared for those industries.

Details of the cutting tool program were worked out by A. A. Mulac of NSRB's Production Equipment Division.

Chicago Area July Investments

THIRTY-FIVE companies in the Chicago area committed themselves for investment of $7,813,000 in industrial facilities in July. Two newly organized companies in the group are:

Judd Steel Products Inc., which acquired space in Skokie, Ill., where it will roll steel shapes from coil stock and Bennett Co., which opened a plant at 1366 W. Randolph St. for metal plating operations.

July investment figure brings the total amount of plant outlay in seven months this year to $60,933,000. Comparable figure in 1948 was $80,348,000.

Shell To Build Oklahoma Pipeline

SHELL Pipe Line Corp., a wholly owned subsidiary of Shell Union Oil Corp., will build a 160-mile pipeline from Elk City, Okla., to Cushing, Okla.

The ten-inch line will cost about $4 million.

CALENDAR OF MEETINGS

Aug. 10-12, Western Packaging Exposition: Civic Auditorium, San Francisco.

Aug. 15-17, Society of Automotive Engineers: National West Coast meeting, Portland, Oreg.

Aug. 23-26, American Institute of Electrical Engineers: Pacific general meeting, Fairmount Hotel, San Francisco. Headquarters are at 33 W. 39th St., New York 18.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 14-16, Porcelain Enamel Institute: 11th annual forum, Ohio State University, Columbus, O. Institute heaquarters are at 1010 Vermont Ave. N.W., Washington.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association heaquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibits committee.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 729 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmount Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary of the society.

Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 14-15, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Southern Ohio Section of Open Hearth Committee, Deshler-Wallick Hotel, Columbus, O. Institute headquarters are at 29 W. 39th St., New York.

Oct. 14-16, Metal Treating Institute: 17th annual meeting, Cleveland.

Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting; write to G. D. O'Brien, assistant manager, Greenbrier Hotel, White Sulphur Springs, W. Va.

Oct. 17-21, 31st Annual National Metal Congress and Exposition: Sponsoring societies are: **American Society for Metals, American Welding Society, Metals Branch of the American Institute of Mining and Metallurgical Engineers** and **Society for Nondestructive Testing.** Public Auditorium, Cleveland. Secretary of American Society for Metals is W. H. Eisenman whose headquarters are at 7301 Euclid Ave., Cleveland 3.

the trend is to N-A-X HIGH-TENSILE STEEL for

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FENDERS • BODY PANELS • DECK LIDS
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Unit of National Steel Corporation

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Buick drives for third place in industry sales with new, low-priced Special. This series is likely to account for 65 per cent of the division's total output

DETROIT

LOUD noises being heard around the country this week are the opening guns in Buick's drive to move into third position in the industry by capturing 10 per cent of all passenger car sales with introduction of its lower-priced and brand new Special model, originally slated for appearance this spring but deferred because of delays encountered in readying the new bodies and in chopping down costs. Instructions reportedly were issued by top administrative levels in General Motors and in Buick for engineers and designers to knock $300 off the manufacturing cost of this model, out of production since last December, and how successful they have been will be revealed when prices are announced this midweek.

The last price quoted on the Special was around $1860 for a four-door sedan, not including transportation, state taxes or optional equipment. If this should be trimmed to, say $1550 then the car could be delivered for about $1850, including taxes, heater and radio, or close to $2000 if the Dynaflow transmission is desired. This would be a spectacular price, giving quite a little concern to Plymouth which is now fairly well entrenched in third sales position, to say nothing of GM's own Oldsmobile and Pontiac divisions.

Whatever the competition feels, Buick is going to push the Special for everything it is worth and is likely to devote 65 per cent of its total production to this series, with perhaps 25 per cent to the Super model and 10 to the Roadmaster. August schedules contemplate something like 40,000 cars.

Uses "B" Body—Because of this, and since the Special marks the first appearance of the intermediate or "B" body in its new version on GM cars, the new Buick baby merits some close scrutiny. Of first significance is the fact it does *not* provide more headroom or legroom than the 1949 bodies which Fisher Body builds in the "A" and "C" series. It embodies many of the same basic design concepts introduced in the "A" bodies for Chevrolet and Pontiac—48 per cent greater windshield area, push-button door handles, wider seats, refinements in trunk lid operation, etc. Only two types of body shells are built, both of the streamlined or "fast" back type, a two-door and a four-door, the former having rear seat in the sedan version and no seat in the coupe. All three styles are mounted on a chassis which is ½-inch longer in wheelbase than the 1948 Special but 3½ inches shorter overall.

Follows Traditional Lines—Anyone who has been expecting something radical or revolutionary in the Special will be disappointed. Innovations, yes; but sticking close to the conventional and traditional for Buick. In many respects the cars reflect intensive efforts engineers have made to cut cost corners. For example, weight has been reduced about 200 pounds which means lower cost as well as a higher power-to-weight ratio with the same engine. Chrome-plated moldings have been eliminated from body sides and rocker panels, as well as from windshields and rear windows. Even in little details like the hood opening mechanism the ax has fallen. Inside controls for the side-opening hood have been dispensed with; instead release is effected by inserting a small hand crank lever into a slot in the rear "ventiport" on the side of the hood, giving it a quarter-turn and thereby releasing the hood catch. This of course means that it is not possible to lock the hood as in previous models.

Grille Simplified—Expensive radiator grille assembly which on some cars costs $75 or more to replace has been simplified by the novel expedient of combining it with the bumper and bumper guard assembly. A row of nine equispaced heavy-gage steel guards, mounted at the center of the bumper face, provides the vertical elements of the "grille" and they are set off by a curving die-cast trim around the front hood opening. The effect is unusual, yet remarkably close to the distinctive Buick design of other models. The bumper guards are flanked by two bomb-shaped guards mounted on the bumper face, projecting slightly from the line of the central group of guards and carrying parking lights in their upper portion. Similarly, on the rear bumper face two central guards and a connecting bar may carry back-up lights. The vulnerability of such a system of mounting might be questioned, although shatterproof plastic lenses are used in the lights and they are encased in heavy-gage steel housings of about the same thickness as conventional bumper guards.

When carrying the Dynaflow drive, the Special has a number of design features not used on standard gearshift versions. Thus, the radiator core is increased in frontal area from 419 square inches to 484 square inches, engine compression ratio is increased from 6.3:1 to 6.9:1 by the use of a slightly different cylinder head, hydraulic valve lifters and oil filter are included, and additional insulation is provided in the form of a ¾-inch blanket of fibrous material on the under side of the hood, this in the interest of further minimizing the effects of engine heat and noise.

Ventiports Relocated — Outwardly the new "B" Buick body shows its principal difference from the side. Instead of the top line of front fenders being carried straight back across the body to meet the rear fender contour it dips slightly and carries across the rear fender in the form of a slight crease. Both front and rear fenders are crimped along the wheel cutout, similar to the Studebaker design. Former ventiports

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	605,000*	489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary

Estimate for week ended:

	1949	(Same week) 1948
July 16	156,436	120,741
July 23	160,123	118,797
July 30	138,223	113,270
Aug. 6	145,000	108,864

Estimates by Ward's Automotive Reports

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on front fenders have been relocated in the hood just ahead of the windshield and their shape has been changed from circular to rounded slots. Most noticeable from the front view is the square cut to the windshield corners, probably aimed at reducing the obstruction to vision which the former rounded treatment may have caused.

Structurally, the body has been made stronger and more rigid, with channel-type reinforcements using double-walled sections and box construction of the frame in every location possible. Box sections are carried even to the roof rails extending from the windshield frame to the rear quarter panel, permitting narrower pillars and a larger rear window. Rigidity in the cowl section is improved by a new front end frame, with a windshield frame of multiple-piece design. The steel defroster duct actually serves as a structural member at this location. Six hat-section channel cross bars support the floor pan and are welded to the rocker panels. There are also two short cross bars at the extreme front of the pan and one at the end of the rear compartment pan. One roof bow about 4 inches wide is located above the center door pillars and is welded to the roof rails.

A 1-inch mat of insulating material is used on the dash to muffle engine and front-end noises. The material is pliable so that it will fit the dash contour snugly; it is covered with a fiber-board panel. The same material is used on the sides of the cowl and on the front and rear floor pans, while another blanket of fibrous mineral insulation is cemented to the under side of the cowl.

Siderails Reinforced—To accommodate the new body, changes have been made in the frame to concentrate strength where it is needed. Siderails have been reinforced and extended forward to provide a stronger mounting for the previously described bumper-grille. Center of the X-member has been moved 4 inches toward the front wheels, and the front center cross members have been redesigned.

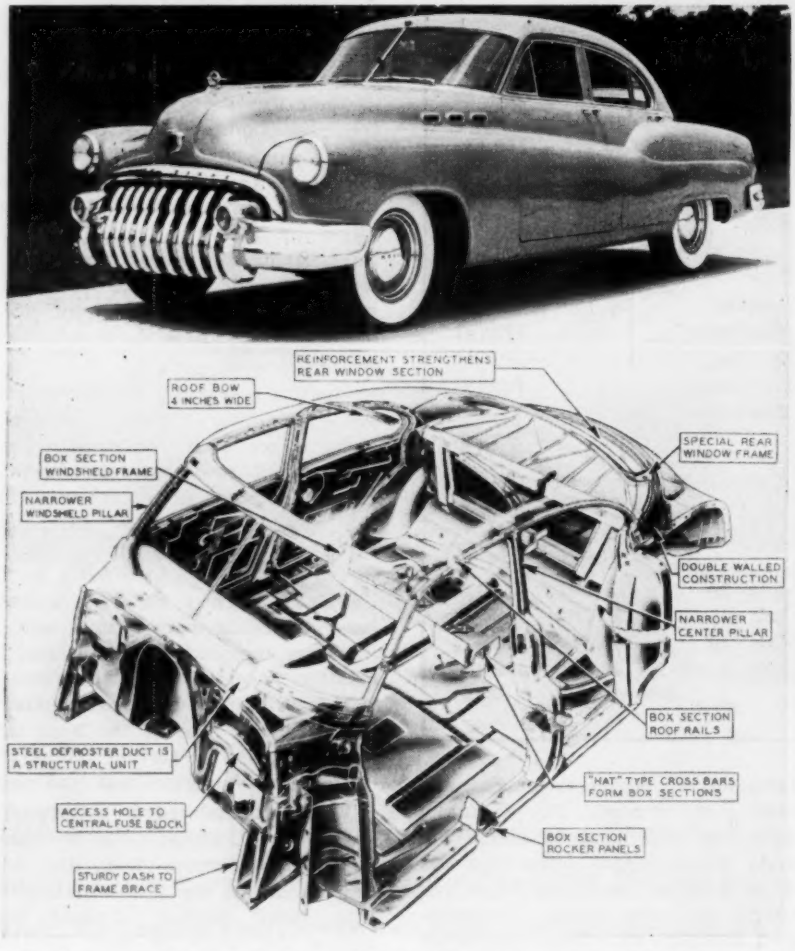
Change in the steering linkage is aimed to give a more positive clamping arrangement of the tie rod ends to both the long and short intermediate rods. The long intermediate rod now has a solid steel section from the center ball stud to the adjusting sleeve, while the short rod is increased in section by 1/32-inch to ¾-inch. Both rods are threaded into the external adjusting sleeves which facilitate adjustment.

A new principle is used for heating and ventilation. Heated air enters the car through openings along the base of the windshield. This air is picked up by a 5½-inch duct at a point just behind the front grille and conducted in nearly a direct line to the defroster core, providing a reported 83 per cent increase in defroster air volume over previous models. This air passes through a hot water heating core, mounted in the dash, itself 86 per cent larger than the old type. In case the forward motion of the car does not force enough air into the intake duct, a blower is provided in the duct to augment the supply. Air emerging from the windshield openings is pulled down and reheated by a recirculating underseat heater.

Doors Open Easily — More easily opened doors with an improved hold-open arrangement are other features. On front doors, two spiral torsion clock springs are used in conjunction with a toggle linkage that forms the check link. Springs assist in opening the door and the spring and toggle system holds the door in full-open position. On rear doors, the combination door check and hold-open comprises a spring steel strap with a wedge-shaped steel block and a semicircular hook at the free end. When the door is opened, a steel roller is forced to pass over the block which is held against the roller by the tension of the spring strap.

Welded Joints Sealed—New precautions have been taken to prevent corrosion of body elements. All welded joints are sealed with compound, and all sound deadener material is completely sealed. In the cowl areas, rear compartment and rear quarter where it is not practical to install sound deadener, a heavy spray is used which insulates and protects against corrosion. Phosphate treatment of steel in critical rust areas plus heavy application of anticorrosion primer protects other surfaces.

These details highlight the long-awaited Buick Special, space limitations preventing the listing of numerous other refinements.


REINFORCEMENT STRENGTHENS REAR WINDOW SECTION
ROOF BOW 4 INCHES WIDE
BOX SECTION WINDSHIELD FRAME
NARROWER WINDSHIELD PILLAR
SPECIAL REAR WINDOW FRAME
DOUBLE WALLED CONSTRUCTION
NARROWER CENTER PILLAR
BOX SECTION ROOF RAILS
STEEL DEFROSTER DUCT IS A STRUCTURAL UNIT
"HAT" TYPE CROSS BARS FORM BOX SECTIONS
ACCESS HOLE TO CENTRAL FUSE BLOCK
BOX SECTION ROCKER PANELS
STURDY DASH TO FRAME BRACE

Shorter overall by 3 inches, wider in the rear seat by 12 inches and cheaper in price by a substantial amount is the new Buick Special. Note grille comprising nine equispaced guards mounted on bumper face; also new body styling. Phantom view of steel skeleton for new General Motors "B" body first introduced on Buick Special. Shown are various box-section and hat-section members for lightness and rigidity

CECO-DROP

The Chambersburg CECO-DROP is a new piston-lift, gravity-drop hammer in which the ram is lifted by air or steam rather than by friction operated boards. There are fewer operating parts, shock-absorbing mechanisms are employed, lubrication is automatic and operation is simple and safe. In shop after shop, over the past few years, the CECO-DROP has amply proved that it can forge more minutes per hour, make more forgings with fewer blows, costs less to operate and is safer and easier on the hammerman.

Write for Bulletin 11-L-9

CHAMBERSBURG SINCE-1897

CHAMBERSBURG ENGINEERING CO. CHAMBERSBURG IMPACT Builders of Impact Machines CHAMBERSBURG, PENNA.

Locomotive Plant in Canada

Construction to begin on 210-acre site at London, Ont. Plant will employ about 1000

GENERAL Motors Corp., Detroit, will begin immediately construction of a diesel-electric locomotive plant in Canada. Options have been obtained covering a 210-acre tract at London, Ont., where a plant with 226,000 sq ft of floor space will be built. Plant will employ about 1000 persons and will draw parts and materials from many Canadian sources.

It will have a capacity of one diesel-electric locomotive per day and will build locomotives for all classes of railway service. Plant operation and distribution of locomotives produced in Canada will be by a new subsidiary of GM, known as General Motors Diesel Ltd. The Canadian plant will work in co-operation with Electro-Motive Division of GM, builders of diesel-electric locomotives in the U. S., with its principal plant at LaGrange, Ill.

Follansbee Resumes Production

TORONTO plant of Follansbee Steel Corp., Pittsburgh, has started production on a small scale. About 20 per cent of the personnel were called back to work. The power plant has been placed back in operation after being closed down for over a month. Work undertaken will be a small amount of cold-rolling, some electric annealing and some work for the pickling plant. Two of the largest departments of the plant will remain inactive, the open hearth and the bar mill.

Rubber Company Plant Building

NATIONAL MOTOR BEARING Co., Redwood City, Calif., has signed contracts for erection of a $500,000 Arrowhead Rubber Co. plant on an 8-acre site at Downey, Calif. Arrowhead is a subsidiary of National. Arrowhead's plant in the industrial section of Los Angeles will be abandoned and all operations transferred to the new plant in Downey.

Hollow Steel Doors Produced

PRODUCTION is now underway on flush hollow steel doors at American Welding & Mfg. Co., Warren, O. Sales for the new product will be handled by the recently established Building Products Division. Swing and sliding closet doors are being produced at the rate of several hundred per day. When tooling is complete, production is expected to increase. The new products will be known under the name, "Amweld."

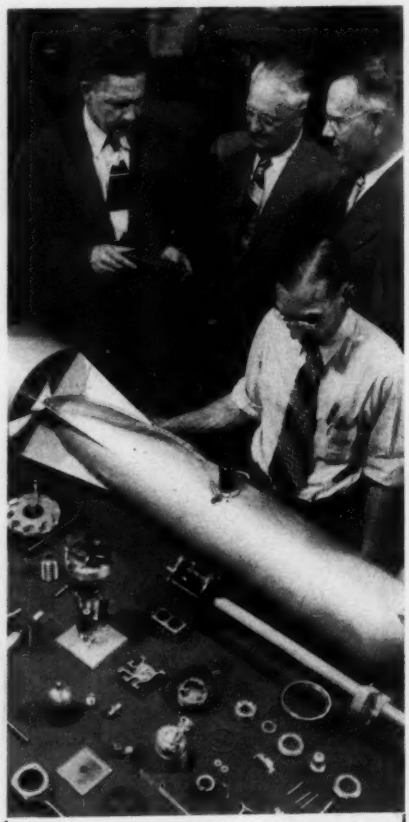
Kaiser Changes Name

KAISER STEEL Corp. is the new name of the West's largest independent steel producer, Kaiser Co. Inc. Change was made to more readily indentify the type of business done by the company.

Kaiser plans to add two more rolling mills to the six it already operates by yearend. The only fully integrated steel plant on the Pacific coast, Kaiser manufactures plates, strip, sheets, structurals, pipe, skelp and bars.

Gulf's New Machine Shop

PLANNED to function 100 per cent as a tool for Gulf Oil Corp.'s research work, the new Gulf Research machine shop supplies all metalworking requirements of the laboratories' staff of chemists, physicists and engineers. It also is producing most of the parts required for geophysical prospecting equipment made by Gulf and used in its exploration activities throughout the world.



AERIAL PROSPECT: Mechanics of the Gulf Research machine shop examine the bomb-like "bird" used in aerial oil prospecting. Products on the table are among those made in the machine shop

Requests for one-of-an-item parts, not always obtainable in the open market are made in the machine shop. Among notable "firsts" constructed were the airborne magnetometer, used in geophysical exploration; the Azon and Razon bombs, guided missiles developed for World War II; and marsh buggies capable of traveling on hard land, in mud or in water, and currently employed in oil exploration in Louisiana and Texas.

3 Machinery Lines Acquired

SEEKING to augment its special machinery business to use increased plant capacity from wartime, Hartford Special Machinery Co. has acquired three standard machinery lines for production in its Hartford, Conn., plant. The company bought the special drilling machinery line formerly manufactured by Langelier Mfg. Co., Cranston, R. I., now in process of liquidation. Hartford Special will take over orders, engineering personnel and sales outlets of Langelier.

300 Per Cent Capacity Increase

WESTERN DIVISION of Irving Subway Grating Co. is undertaking a 300 per cent increase in capacity by moving into a new and larger plant in Oakland, Calif. Former location of the plant was in Emeryville, a suburb of Oakland. Firm is the largest producer of steel flooring, bridge decking and grills in the West.

Permanente Buys 3 Plants

PERMANENTE METALS CORP. has purchased three government-owned aluminum plants for $36 million. Sale of the plants—one in Baton Rouge, La., and two in Spokane, Wash.—was made through War Assets of General Services Administration. Purchase price represents 80 per cent of the fair value placed on the properties by War Assets. Permanente had been operating the plants under lease with option to buy since early 1946.

Properties included in the sale are: Mead aluminum plant with a production capacity of 216 million pounds per year and Trentwood rolling mill, capacity of 288 million pounds, both in Spokane; and Alumina plant with a capacity of 500,000 pounds of alumina from bauxite each year, at Baton Rouge.

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Sturgis Products Co., Sturgis, Mich., has changed its name to Roto-Finish Co. and is now occupying its new plant at Kalamazoo, Mich. Roto-Finish makes deburring and finishing machines.

—o—

A. S. Campbell Co. Inc., Boston, producer of automotive and metal stamping lines, has purchased through a newly formed subsidiary assets of Rollins Engine Co., Nashua, N. H. The new company, Rollins Engine & Machine Co. Inc., will maintain its plant and organization at Nashua with Russell L. Sylvester, former owner of Rollins, as vice president and general manager.

—o—

Nelson Stud Welding Division of Morton Gregory Corp., Lorain, O., has appointed Industrial Supply Co. Inc., Salt Lake City, Utah, as distributor for its welding equipment in Utah, Montana and parts of Idaho, Wyoming and Nevada.

—o—

Steel Service Inc., Steubenville, O., has opened a sales office at 1017 Fisher Building, Detroit. Office will sell flat-rolled steel, sheared blanks, etc.

—o—

Cyclone Fence Division of U. S. Steel Corp. has opened an office at 1407 Chester Ave., Bakersfield, Calif. Manager is M. V. Perra.

—o—

Bigelow-Liptak Corp., Detroit, has selected Stapp Engineering Co., Denver, as agent for sale of unit-suspended walls and arches for industrial furnaces.

—o—

U. S. Lines' new superliner and naval auxiliary, designed by Gibbs & Cox, will be equipped with Foster Wheeler Fin-Tube economizers and Babcock & Wilcox oil burners.

—o—

Hewitt Rubber Division of Hewitt-Robins Inc., Buffalo, has appointed Hines Bearings & Industrial Supply Co., Billings, Mont., as distributor of Hewitt industrial rubber products in Billings and surrounding territory.

—o—

Stacey-Dresser Engineering, one of the Dresser Industries, Cleveland, is building a Stacey-Dresser Desulfo unit for Hoosier Gas Corp., Vincennes, Ind.

—o—

Harry Ferguson Inc., manufacturer of Ferguson tractors and farm implements, has developed a new side delivery rake featuring a true lateral motion which reduces movement of hay from swath to windrow by 50 per cent, the company announces.

—o—

Odin Stove Mfg. Co., Erie Pa., has entered the electric range field. First electric model announced is a 30-inch Beautyrange. Line is in the medium price field.

—o—

American Steel & Wire Co., Cleveland, has established two full-time scholarships for employees and their sons at Case Institute of Technology, Cleveland.

—o—

Triplex Corp. of America, manufacturer of aluminum alloy precision pistons, has moved its office and plant from Chicago to Pueblo, Colo.

—o—

Lima-Hamilton Corp., Lima, O., is building three rotary snow plows, first equipment of this type built by the company.

—o—

Industrial Products Division of Elgin National Watch Co., Elgin, Ill., will use the word "Dymo" as a tradename for its diamond compound. Industrial Products Division is in Aurora, Ill.

—o—

Foundry Division of Hansell-Elcock Co., Chicago, which not long ago suffered extensive fire damage to its pattern storage and core rooms, has constructed temporary quarters for these departments and is offering normal service on new gray iron castings orders.

—o—

Nicholson File Co., Providence, R. I., offers a lecture service on how to select and use the right file.

—o—

American Trucking Associations Inc., Washington, has published a revised edition of "Economic Giant," pocket-size booklet showing the economic importance of America's trucking industry.

—o—

Hyster Co.'s new location for industrial truck sales and service in Seattle is 753 Ninth Ave.

—o—

Kansas City Bridge Co. has opened new general offices at 928 Broadway, Kansas City, Mo.

—o—

Moore-Handley Hardware Co. has opened its new offices and warehouse in Nashville. With the Birmingham home plant and the Mobile division, opened earlier in the year, the company has about 1 million square feet of office and warehouse space.

—o—

Strand Garage Door Division of Detroit Steel Products Co., Detroit, reports sale of Strand all-steel garage doors for the first six months of 1949 exceeded the same period in 1948 by over 20 per cent.

—o—

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has opened a new sales office at 250 Boylston St., Boston, under supervision of J. W. Bramley.

—o—

Magnesium Division of Dow Chemical Co., Midland, Mich., presented a program on magnesium at the Lehigh University Product Seminar at the university last week. Purpose of the seminar was to prepare managerial-level men to initiate and administer product design projects.

—o—

American Machine Works, Racine, Wis., has put a new "link grip" wrench on the market. Instead of two opposing jaws contacting solid rounds to be gripped, all jaws in contact grip the work around its entire periphery.

—o—

Pratt & Whitney Aircraft Division of United Aircraft Corp., East Hartford, Conn., has made its JT-6B Turbo-Wasp jet engine available for commercial use. Engine delivers 5000 pounds thrust—over 1000 pounds more than any other jet engine certified by the Civil Aeronautics Administration, the company reports.

—o—

United States Steel Corp. has released a new technicolor motion picture, "An Orchid to Mr. Jordan," which illustrates many of the applications of stainless steel.

—o—

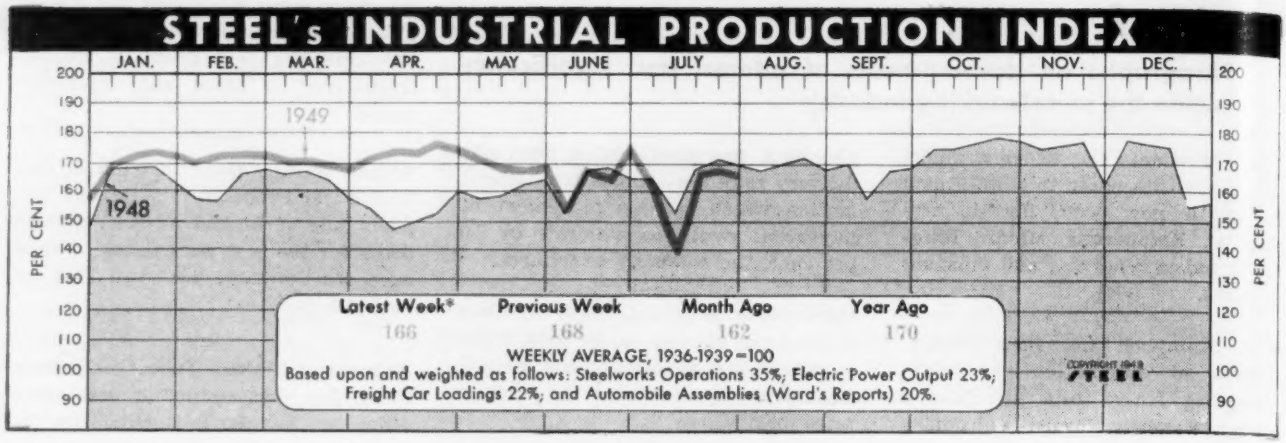
A $475,000 federal grant for a new terminal area at Billy Mitchell Field, Milwaukee, has been made by the Civil Aeronautics Administration.

—o—

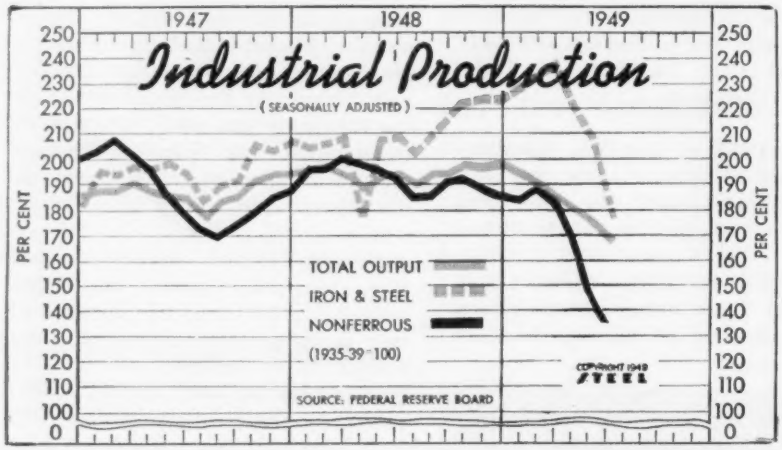
California Wire Cloth Corp., subsidiary of Colorado Fuel & Iron Corp., Denver, has opened a new warehouse in Seattle.

—o—

United Engineering Co., San Francisco, has reconverted part of its facilities and is entering the general engineering field. Normally the company's chief operations are in ship repair, but it has received about $500,000 in contracts from federal agencies for equipment for dams and navigation locks.

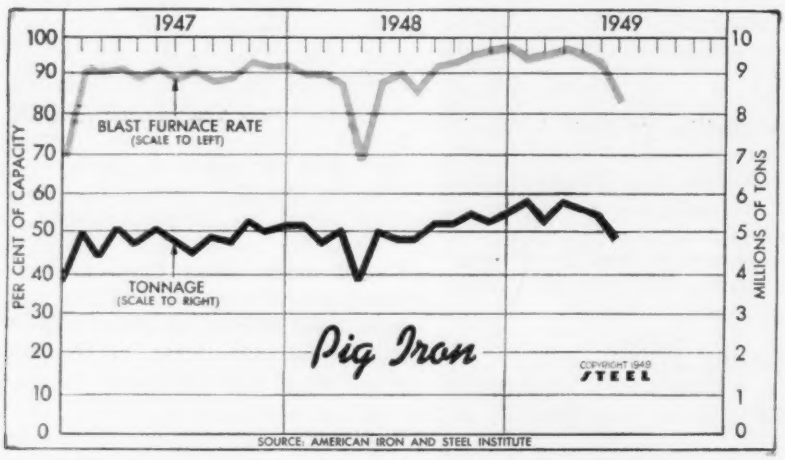

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1949
1948
Latest Week* 166
Previous Week 168
Month Ago 162
Year Ago 170
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1949 STEEL

* Week ended July 30 (preliminary).



Federal Reserve Board's Production Indexes (1935-39=100)

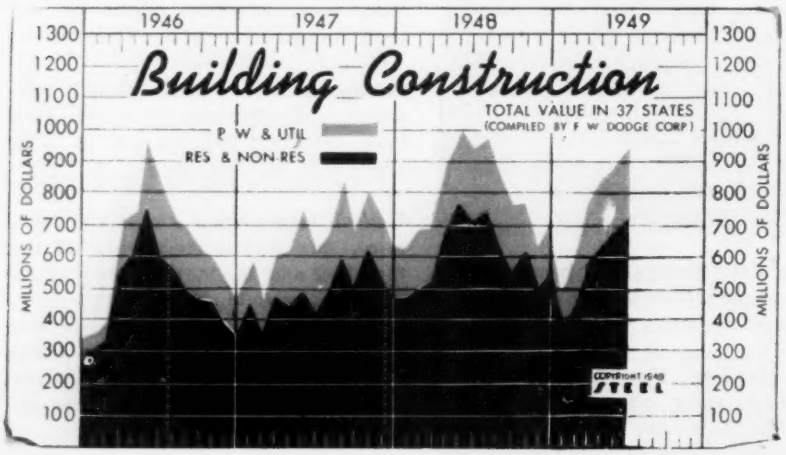
	Total Production		Iron, Steel		Nonferrous	
	1949	1948	1949	1948	1949	1948
Jan.	191	193	228	203	184	197
Feb.	189	194	232	203	186	197
Mar.	184	192	233	207	183	200
Apr.	179	188	219	177	168	198
May	174	191	204	206	145	196
June	169	192	177	208	135	194
July	...	186	...	200	...	185
Aug.	...	191	...	207	...	186
Sept.	...	191	...	214	...	191
Oct.	...	195	...	221	...	192
Nov.	...	195	...	223	...	187
Dec.	...	192	...	222	...	185
Ave.	...	192	...	208	...	193



Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1949	1948	1947	1949	1948	1947
Jan.	5,725	5,194	5,071	95.5	90.9	90.8
Feb.	5,223	4,838	4,550	96.5	90.6	90.3
Mar.	5,820	5,020	5,123	97.1	87.8	91.8
Apr.	5,531	3,840	4,830	95.3	69.4	89.3
May	5,517	5,077	5,081	92.0	88.8	91.0
June	4,819	4,990	4,810	83.0	90.2	89.0
July	....	4,900	4,585	...	85.9	90.3
Aug.	....	5,255	4,916	...	92.0	88.1
Sept.	....	5,208	4,801	...	94.3	89.0
Oct.	....	5,520	5,228	...	96.6	93.6
Nov.	....	5,399	5,015	...	97.6	92.8
Dec.	....	5,595	5,177	...	98.1	92.9
Total	....	60,849	59,210	Ave. ...	90.2	90.1

* Includes ferromanganese and spiegeleisen.



Construction Valuation in 37 States (Unit—$1,000,000)

	Total	Public Works, Utilities		Residential and Non-residential	
	1949	1949	1948	1949	1948
Jan.	483.0	102.0	136.6	381.0	478.6
Feb.	568.5	153.5	177.3	415.0	504.6
Mar.	747.6	168.4	164.3	579.2	525.5
Apr.	842.6	222.4	184.7	620.2	689.2
May	880.3	213.5	205.0	666.9	765.8
June	945.7	239.0	215.7	706.7	719.5
July	....	....	217.9	....	744.8
Aug.	....	....	207.8	....	646.3
Sept.	....	....	202.7	....	559.5
Oct.	....	....	165.5	....	613.1
Nov.	....	....	106.9	....	504.3
Dec.	....	....	170.9	....	523.1
Total	....	....	2,155.3	....	7,274.4

The Business Trend

INCREASED production by the steel industry did not compensate for the drop in automotive assemblies in the week ended July 30 with the net result that STEEL's industrial production index for the week declined to a preliminary 166 per cent of the 1936-1939 average from 168 in the preceding week. In the corresponding week of 1948 the index was 170.

STEEL—The ingot rate rose 4 points in the week ended July 30 to 81 per cent of capacity. This was the first rise recorded since the slump in the steel rate began in mid-March. Operations in the like week in 1948 were at 93 per cent of capacity.

AUTOMOBILES—Heat-wave walkouts and changeover suspension by an independent builder caused the outturn of passenger cars and trucks to drop to 138,223 units in the week ended July 30, off about 22,000 from the preceding week. The revised total of 160,173 vehicles in the preceding week set an all-time weekly high for the industry. August assemblies are aimed at setting a new monthly mark.

BUSINESS—Dun & Bradstreet Inc. reports stock company formations totaled 7260 in June. This was a drop of 2.5 per cent from the 7445 formations in May and 15 per cent below June, 1948. During the first half of 1949, new business incorporations aggregated 43,883, the smallest six-month total in the postwar period.

COAL—Bituminous coal output amounted to 6,965,000 net tons in the week ended July 23. The effect of the abbreviated work-week in the industry is readily visible when comparison is made with the 12.3 million tons mined in the corresponding week last year.

CONSTRUCTION—Civil engineering construction volume totaled $131.8 million in the week ended July 28. This total is 17 per cent below the volume for the preceding week but 17 per cent above the corresponding week in 1948.

RAILROADS—Net railway operating incomes of the Class I railroads in June amounted to $43.4 million, less than half of the $94 million reported in June, 1948. Association of American Railroads estimates net income for the first half of 1949 at $173 million, compared with $262 million in the like period of last year.

PRICES—Average primary market prices declined 1 per cent in the week ended July 26 to 152.8 per cent of the 1926 average. The Bureau of Labor Statistics index now stands 9.6 per cent below the same week in 1948. The metals and metal products index continued its advance during the week on the strength of renewed activity in the nonferrous markets and the resulting price rises in nonferrous metals.

PRODUCTION—The industrial production index of the Federal Reserve Board continued its decline in June to 169 per cent of the 1935-1939 average, down 5 points from May and down 23 points from June, 1948. The iron and steel rate fell to 177 in June from 204 in May. Nonferrous metals and products went down to 135 from 145 in the preceding month.

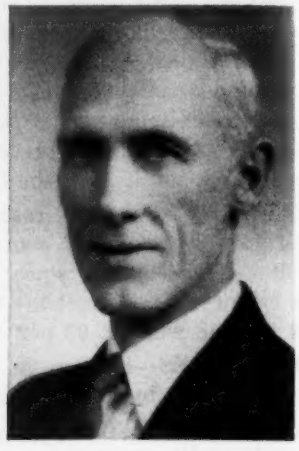
BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	81.0	77.0	80.0	93.0
	Electric Power Distributed (million kilowatt hours)	5,518	5,461	5,410	5,352
	Bituminous Coal Production (daily av.—1000 tons)	1,161	1,100	1,963	2,056
	Petroleum Production (daily av.—1000 bbl)	4,677	4,684	4,819	5,455
	Construction Volume (ENR—Unit $1,000,000)	$131.8	$158.8	$180.9	$114.3
	Automobile and Truck Output (Ward's—number units)	138,223	160,173	144,822	113,270
	* Dates on request. † 1949 weekly capacity is 1,843,516 net tons, 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	721†	719	644	894
	Business Failures (Dun & Bradstreet, number)	168	182	177	98
	Money in Circulation (in millions of dollars)‡	$27,333	$27,366	$27,426	$27,821
	Department Store Sales (changes from like wk. a yr. ago)‡	−11%	−10%	−6%	+8%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,721	$13,187	$13,499	$13,016
	Federal Gross Debt (billions)	$253.2	$252.9	$251.6	$253.4
	Bond Volume, NYSE (millions)	$13.1	$22.9	$12.4	$14.5
	Stocks Sales, NYSE (thousands of shares)	4,617	5,286	3,334	4,490
	Loans and Investments (billions)†	$62.3	$62.9	$62.6	$63.2
	United States Gov't. Obligations Held (millions)†	$35,507	$35,254	$34,515	$34,879
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.82	$91.82	$91.82	$90.05
	STEEL's Nonferrous Metal Composite‡	178.3	175.9	164.6	209.8
	All Commodities†	152.8	154.3	152.9	169.1
	Metals and Metal Products†	167.9	167.8	165.7	166.3
	† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.				

Men of Industry

GEORGE P. F. SMITH

HOWARD E. BLOOD



THOMAS F. DORSEY

Howard E. Blood, president and general manager, Norge Division, and president, Detroit Gear Division of Borg-Warner Corp., Chicago, has been elected chairman of the board of the Norge Division, retaining his post as president of Detroit Gear. Mr. Blood is also a vice president of Borg-Warner. **George P. F. Smith,** Borg-Warner vice president, has been elected to succeed Mr. Blood as president and general manager of Norge Division. He has been serving as assistant to **G. A. Shallberg,** Borg-Warner executive vice president in Chicago. Changes in the Norge Division permit Mr. Blood, as president of Detroit Gear, to devote more time to the development and manufacture of the new Borg-Warner automatic transmission.

—o—

Harry R. Ekblade has been appointed general service manager, Oldsmobile Division, General Motors Corp., Detroit. He succeeds **J. J. Dobbs,** named administrative assistant to the general sales manager of the division, replacing **L. L. Johnson,** named zone manager of Oldsmobile Division in Philadelphia.

—o—

Robert Penovich has been appointed purchasing agent, Cleveland Chain & Mfg. Co., Cleveland. He formerly was affilliated with Wilson Foundry & Machine Co., Pontiac, Mich.

—o—

William G. Findlay, manager of the Pittsburgh plant, Joseph T. Ryerson & Son Inc., Chicago, has been transferred to Chicago as manager of the work order division in charge of work order sales for all Ryerson steel-service plants. **A. L. Petersen,** manager of the St. Louis plant, succeeds Mr. Findlay at Pittsburgh. **John M. Acee,** manager of sales at St. Louis, has been named manager of that plant, succeeding Mr. Petersen.

—o—

Watson P. Hall has joined **Robert Campbell** in the Toronto, Ont., sales office of American Wheelabrator & Equipment Corp., Mishawaka, Ind. For the last three years Mr. Hall has been a member of the service engineering staff of the company, and had previously been associated with Consolidated Mining & Smelting Works, North Ontario and Nova Scotia.

—o—

John L. MacQuown has been named to represent Warner & Swasey Co., Cleveland, in Hartford, Conn., supplementing the Cambridge, Mass., district sales office activity.

—o—

Charles W. Owens has been appointed superintendent of the Birmingham plant of Harbison-Walker Refractories Co. Associated with the company since 1935, he served as superintendent of the Athens, Tex., plant from 1942 to 1944.

—o—

Chain Belt Co., Milwaukee, announces appointment of **Douglas Jones** as manager of the Salt Lake City, Utah, district office.

—o—

Wean Engineering Co. Inc., Warren, O., announces the following organizational changes: **M. D. Baughman Jr.,** appointed assistant chief engineer; **A. A. Schmidt,** named supervisor of construction and design engineering; **W. O. Jones,** appointed chief design engineer; **C. D. Shickley,** appointed chief draftsman of construction; **J. A. Weaver,** appointed purchasing agent; and **A. P. Huntley,** named assistant purchasing agent and traffic manager.

—o—

Thomas F. Dorsey has been elected president, Pittsburgh Steel Foundry Corp., which operates steel foundries in Glassport, Pa., and McKeesport, Pa., and also operates Pittsburgh Engineering & Machine Co. at Glassport. Mr. Dorsey has been general manager of Fort Pitt Steel Casting Division, McKeesport, since it was purchased in 1945 by the corporation. In 1947 he became vice president of the corporation, and in 1948 assumed the duties of general manager of the Glassport foundry, as well as Fort Pitt. Mr. Dorsey will continue as general manager of the corporation, with offices in Glassport and McKeesport.

—o—

Appointment of **Myron T. Herreid** as vice president and general manager, Gas & Coke Division, has been announced by Koppers Co. Inc., Pittsburgh. He succeeds **W. Reed Morris** who retired on Aug. 1 after 34 years' association with the company. Mr. Morris will also relinquish his duties as eastern representative of the entire Koppers Co. with these duties being taken over by **K. R. Hare,** manager of the Gas & Coke Division's Seaboard coke plant, Kearney, N. J. Mr. Morris will, however, act as special consultant for Koppers to the gas and coke industries, with headquarters in New York.

—o—

Robert R. Magnetti has been named branch manager of the Gary, Ind., office of Reliance Electric & Engineering Co., Cleveland. He had 18 years of experience in the steel in-

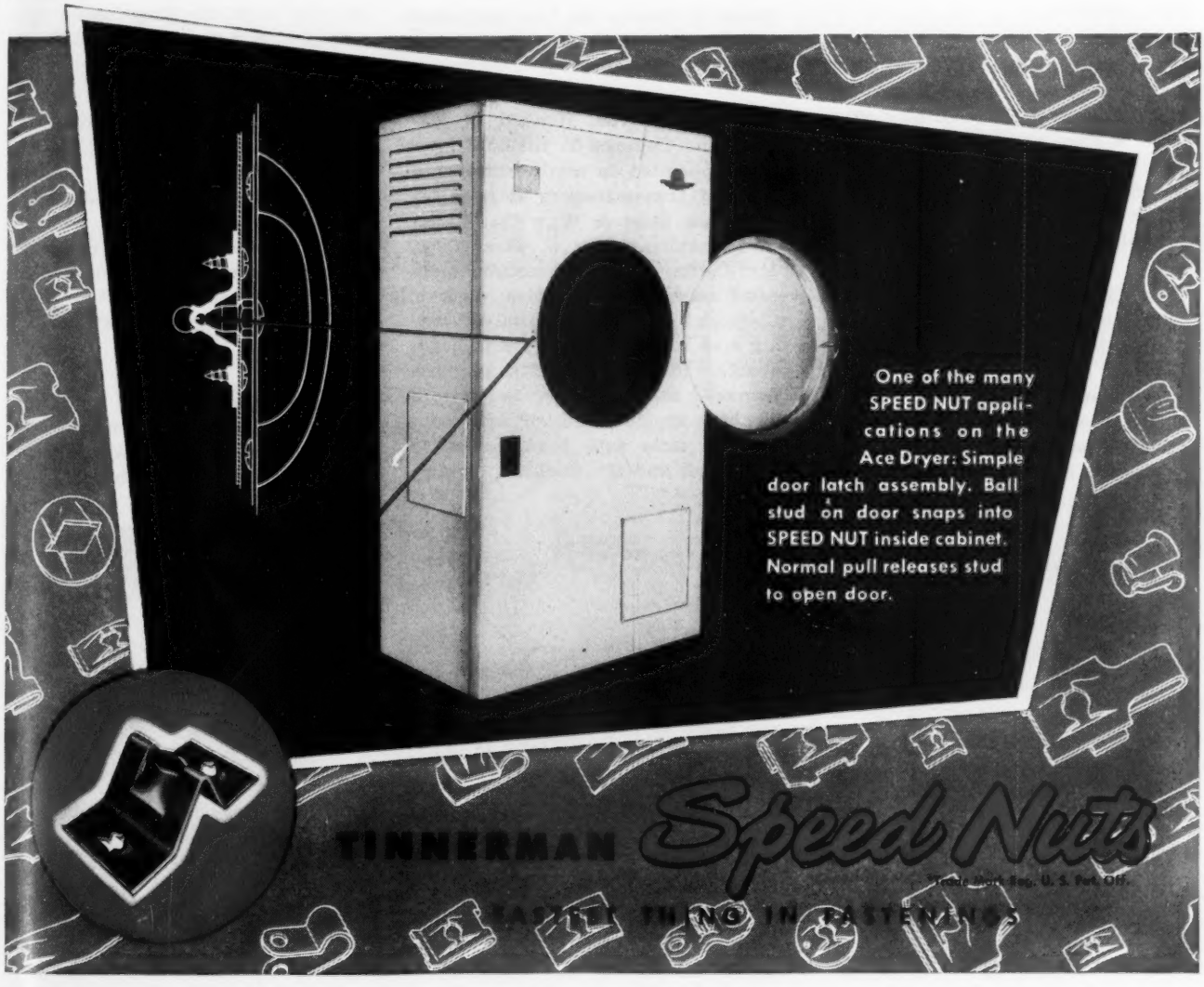
COST REPORT REVEALS

70% MATERIAL SAVINGS
46% ASSEMBLY SAVINGS

FOR ACE CABINET CORP.
NEW BEDFORD, MASS.

"Surprising cost reductions were effected when we used 64 SPEED NUTS on our new commercial type clothes dryer," states Mr. W. Wallace Pittendreigh, Chief Engineer, Ace Cabinet Corporation.

"We not only eliminated 32 parts, but also reduced to a minimum the number of steps required to assemble the dryer. Still another outstanding benefit was the vibration-proof attachment provided by the various types of SPEED NUTS we are using". Today's market conditions dictate the need for reduced assembly costs and increased product quality. Perhaps SPEED NUTS are the answer for you, too. Find out from your Tinnerman representative. He's listed in major city phone directories. Or write: TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners, Limited, Hamilton.


One of the many SPEED NUT applications on the Ace Dryer: Simple door latch assembly. Ball stud on door snaps into SPEED NUT inside cabinet. Normal pull releases stud to open door.
TINNERMAN
Speed Nuts
Reg. U. S. Pat. Off.

dustry prior to joining Reliance early this year. The firm has also named field sales personnel for the following field offces: **Emory G. Orahood Jr.,** Atlanta; **Robert B. Reed,** Birmingham; and **John Drollinger Jr.,** Detroit.

—o—

Utica Drop Forge & Tool Corp., Utica, N. Y., has appointed **Dr. F. N. Darmara** as director of metallurgy and research. In his new position Dr. Darmara will have complete charge of laboratory work, metallurgical and technical control of all products and processes and metallurgical research and development. He came to Utica Drop Forge from the research laboratory of U. S. Steel Corp. and prior to that time was research metallurgist of the Jet Propulsion Laboratory, National Advisory Committee for Aeronautics.

—o—

New officers of the Milwaukee Industrial Marketing Association are: **D. E. Fricker,** Heil Co., treasurer; **Walter G. Cruice,** Pohlman Studios, secretary; **Bruce Stabelfeldt,** Blackhawk Mfg. Co., president, and **N. H. Jacobson,** Allis-Chalmers Mfg. Co., vice president.

—o—

W. W. Pyeatt has rejoined Black, Sivalls & Bryson Inc., Kansas City, Mo., to direct its New Orleans office. Until a year ago he was connected with the company's engineering department at Oklahoma City, Okla., before engineering operations were centralized in Kansas City.

—o—

E. J. Chapman, regional sales manager of Pontiac Motor Division, General Motors Corp., Pontiac, Mich., has been appointed assistant general sales manager, succeeding **Norman E. Perry** who has resigned to enter private business. Mr. Chapman has been with Pontiac sales since 1933, serving in various capacities prior to his appointment to regional sales manager in December, 1948.

—o—

J. B. Trotman has been elected executive vice president, Everite Pump & Mfg. Co., Lancaster, Pa. He was associated for a number of years with Goulds Pumps Inc. in Seneca Falls, N. Y., and later as manager in its Philadelphia and Chicago offices. He had association also with Roots-Connersville Blower Corp., Connersville, Ind., as general manager of its Turbine Pump Division, and during the war served as general sales manager, Blackmer Co., Grand Rapids, Mich. His most recent connection was with Bowser Inc., Fort Wayne, Ind., where he served as general manager, Industrial Pump Division.

—o—

Lloyd C. Shackelford has been named a wire and cable specialist for the construction materials department, General Electric Co. He will make his headquarters in Seattle. He joined the company in 1941 and for the last year has been in charge of the government and transportation quotations section.

—o—

Harold R. Weber has been appointed purchasing agent of F. J. Littell Machine Co., Chicago.

—o—

Roswell F. Curtis, Howard B. Maguire and **Clarence T. Gilchrist** have been appointed to newly established posts of area managers of sales for American Steel & Wire Co., Cleveland, subsidiary, U. S. Steel Corp. Mr. Curtis, formerly manager, manufacturers' products sales division, Cleveland, has been appointed eastern area manager of sales with headquarters in New York; Mr. Maguire, formerly sales manager in Detroit, has been appointed central area manager of sales with headquarters in Cleveland; and Mr. Gilchrist, formerly assistant general manager of sales for the Chicago district, has been appointed western area manager of sales with headquarters in Chicago.

—o—

Laban E. Harmon, Standard Oil Co. of Indiana, has been elected chairman of the advisory committee for the Chicago chapter of American Society of Corporate Secretaries Inc., Chicago. **Graydon Megan,** Inland Steel Co., is vice chairman and **S. P. Martin,** United Air Lines, secretary. Other committee members are **Ralph E. Bowers,** Marshall Field & Co.; **John R. Covington,** Oliver Corp.; **Gerard J. Eger,** International Harvester Co.; and **Thornton A. Rand,** Acme Steel Co.

—o—

Alfons Alven has been appointed general sales manager of Rollway Bearing Co. Inc., Syracuse, N. Y., subsidiary, Lipe-Rollway Corp. Mr. Alven previously was president of Bearings Co. of America, Lancaster, Pa.

—o—

Col. Oscar C. Maier has joined Pullman-Standard Car Mfg. Co., Chicago, as director of research. He resigned recently from the Engineering Division of U. S. Army Air Forces, Wright Field, O.

—o—

A. S. Blagden has been elected president and director of Federal Machine & Welder Co., Warren, O., succeeding Malcolm S. Clark, resigned.

—o—

V. C. Schorlemmer has been elected secretary-treasurer of Consolidated Vultee Aircraft Corp., San Diego, Calif., succeeding the late **W. M. Shanahan.**

—o—

A. D. Forbes has been appointed manager of general engineering, Atomic Power Division, Westinghouse Electric Corp., Pittsburgh. Mr.

CLARENCE T. GILCHRIST

HOWARD B. MAGUIRE

ROSWELL F. CURTIS

These 4 TIMKEN® graphitic steels will fill most of your tool steel needs!

GENERAL PURPOSE

TIMKEN GRAPH-MO

Timken® Graph-Mo is a *general purpose* oil hardening tool room steel. It offers big advantages for any tool job that requires a steel with excellent machinability, exceptional wear resistance, freedom from scuffing and scoring, structural stability, excellent response to heat treatment, and good anti-frictional properties.

SPECIAL PURPOSE

TIMKEN GRAPH-TUNG
for extra resistance to abrasion

Graph-Tung possesses all the general advantages of Timken graphitic steels, plus extra high hardenability to resist abrasion.

TIMKEN GRAPH-AL
for extra impact strength

In addition to the general graphitic tool steel advantages, Timken Graph-Al has shallow hardening properties that make it stand up well under impact.

TIMKEN GRAPH-M.N.S.
for extra strength in small cross-sections and long lengths

Timken Graph-M.N.S. has unusually high strength and rigidity, in addition to the other Timken graphitic steel advantages.

TIMKEN graphitic steel contains free graphite and well-distributed carbides in its structure. As a result, graphitic steels (1) machine fast and easily, (2) resist wear and abrasion and retain lubricants better, and (3) have minimum tendency to scuff, seize, or score. Timken graphitic steels also respond uniformly to heat treatment, have uniform stability.

The Timken Company offers four specially developed analyses of Timken graphitic tool steels to meet your individual requirements. Timken Graph-Mo is a general-purpose tool steel. Graph-Tung, Graph-Al, and Graph-M.N.S. are for special applications. For the latest information on all four graphitic steels, write for the new, enlarged 9th edition of the Timken Graphitic Tool Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

50th birthday of the company whose products you know by the trade-mark: TIMKEN

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

Fine Alloy

STEEL

and Seamless Tubes

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

GEORGE M. FEIEL

C. J. ROWLES

OTTO J. LEONE

Forbes joined Westinghouse in 1934 as an engineer in the Transformer Division, and has held a number of executive engineering positions prior to his latest appointment.

—o—

George M. Feiel has been appointed comptroller, Republic Steel Corp., Cleveland, succeeding the late **Pearce F. Boyer.** Mr. Feiel has been assistant comptroller since 1941. **A. H. Erb,** also assistant comptroller, continues in that capacity, and **Ralph E. Waldo,** formerly assistant to the comptroller, has been promoted to assistant comptroller.

—o—

Birmingham Tank Co., division of Ingalls Iron Works Co., Birmingham, announces appointment of **George Roberts** as sales manager to fill the vacancy created by resignation of **J. W. Billings.**

—o—

J. F. Wagner has been elected president, Independent Oxygen Manufacturers' Association. He is vice president in charge of production, Burdett Oxygen Co. of Cleveland Inc., vice president, Burdett Oxygen Co. of California, Los Angeles, and vice president, American Industrial Safety Equipment Co., subsidiary, Brooklyn, N. Y.

—o—

Benjamin F. Fairless, president, United States Steel Corp., New York, was given an honorary degree by Bryant College, Providence, R. I., at the 86th commencement of that college Aug. 5.

—o—

Charles F. Kells, managing director of Electric Industrial Truck Association, Long Island City, N. Y., has resigned to become eastern manager of B. J. Martin Publishing Co., Chicago.

—o—

Triangle Steel Co., Los Angeles, announces appointment of **C. W. Heflin** as manager of sales. Mr. Heflin was formerly with Los Angeles Division, Columbia Steel Co. as assistant sales manager.

—o—

C. J. Rowles has been elected vice president of Euclid Electric & Mfg. Co., Madison, O. Mr. Rowles came to Euclid after many years of association with General Electric Co. as an industrial salesman.

—o—

Gustave Stuart Geiger has retired as vice president of American Steel Co. of Cuba, New York.

—o—

C. M. Lewis has been elected president of Badger Malleable & Mfg. Co., South Milwaukee, Wis. He succeeds **A. J. Ricker,** one of the firm's founders, who will retire on Aug. 31. Other company officers are: **T. E. Ward,** secretary and treasurer; **Leo Joerg,** assistant secretary; and **A. F. Schwan,** assistant treasurer.

—o—

Appointment of **Mark C. Simpson** as sales manager, Pennsylvania Sales Division, Templeton, Kenly & Co., Chicago, has been announced. Mr. Simpson previously held posts with Hockensmith Wheel Mine Car Co., Phillips Mine & Mill Supply Co. and Brown Fayro Co.

—o—

A. J. Fruchtl, assistant to the vice president in charge of operations, U. S. Pipe & Foundry Co., E. Burlington, N. J., has been appointed resident manager of the company's N. Birmingham plant, Birmingham. He served as chief of maintenance for all the company's operations in his former position.

—o—

Dan H. Mathews, previously in the Indianapolis district office, Detroit Steel Corp., Detroit, has been placed in charge of a new district office in Davenport, Iowa, for the Reliance Steel Division's midwest plant, Chicago. He will serve customers in Iowa, north central Illinois and northeastern Missouri.

—o—

Otto J. Leone has been appointed manager of industrial sales for Trion Inc., McKees Rocks, Pa. He is the author of several papers on instruments and controls and their applications in steel mills, and has past association with Bristol Co., Waterbury, Conn., and as manufacturer's representative for John D. Hiles Co. Inc., Pittsburgh, also serving as secretary of that company. Since last December Mr. Leone has been engaged in special engineering and consultant work.

—o—

Frank Ross, national manager of lubrication for E. F. Houghton & Co., Philadelphia, has been appointed to the newly created post of assistant to the vice president of sales, and will retain his duties as head of the lubrication department. He has transferred headquarters from Cleveland to Philadelphia.

—o—

A. J. Rinnander, formerly with Chicago Pneumatic Tool Co., New York, has become a member of Harnischfeger Corp., Milwaukee, and will supervise field activities under direction of **E. W. Potratz,** manager, Hoist & Trav-Lift Crane Division, Milwaukee.

—o—

Glenn H. Alberga has been appointed plant manager of Laminated Shim Co., Glennbrook, Conn. He came to his new connection from John J. Plocar Co., Stamford, Conn., consulting management engineering firm, where he was general manager and chief engineer for the last seven years.

—o—

William Campbell has been appointed sales representative, LaSalle Steel

L. H. FLORA

Named chief engineer, Tinnerman Products Inc., Cleveland. Noted in STEEL, Aug. 1 issue, p. 66

R. A. HARTMAN

Appointed manager of field engineering, Tinnerman Products Inc., Cleveland. Noted in STEEL, Aug. 1 issue, p. 66

JOHN W. HUMPHREY

Named general superintendent, Youngstown operations, Carnegie-Illinois Steel Corp. Noted in STEEL, Aug. 1 issue p. 70

Co., Chicago, covering part of Chicago and nearby territory. He formerly was associated with Inland Steel Co.

—o—

Appointment of **Paul S. Killian** as vice president in charge of purchasing is announced by Bethlehem Steel Co., Bethlehem, Pa. He succeeds the late **Charles R. Holton.** Mr. Killian has been associated with Bethlehem since 1917 and served in various capacities in the purchasing department prior to being elected purchasing agent of the company on Jan. 1, 1944.

—o—

National Sprayer & Duster Association has elected **C. D. Leiter,** general manager of sales, F. E. Myers & Bro. Co., Ashland, O., as president to succeed **R. C. Hudson,** president, H. D. Hudson Mfg. Co., Chicago. **Ralph B. Chapin,** president, R. E. Chapin Mfg. Works Inc., Batavia, N. Y., was elected vice president.

—o—

National Radiator Co., Pittsburgh, has added to the board of directors **Benjamin T. Hain,** vice president for manufacturing, and **Carroll M. Baumgardner,** vice president for sales. **John G. dePass,** general credit manager, was elected assistant secretary.

—o—

Frank W. McCann, head of centrifugal pump sales at the Indiana Works, Indianapolis, of Food Machinery & Chemical Corp., has been appointed manager of the Atlantic district sales, Peerless Pump Division, with headquarters in New York. He will serve the New England and Middle Atlantic states. **Robert H. Hull** succeeds Mr. McCann at Indianapolis. He previously was in charge of sectional sales of the company's vertical pump line, and was located at Los Angeles Works.

—o—

Dr. Paul J. Brodeur has been appointed chief chemist of the Metal Finishing Division, Pyrene Mfg. Co., Newark, N. J.

—o—

J. W. Morgan has been advanced to assistant sales manager of the eastern sales division, Hyster Co., Portland, Oreg. He will be in charge of tractor equipment sales activities and will be located at the Hyster plant in Peoria, Ill.

OBITUARIES . . .

Frederick K. Vial, 85, director and former vice president, Griffin Wheel Co., Chicago, died in Urbana, Ill., July 27. Mr. Vial had a prominent part in forming the Association of Chilled Car Wheel Manufacturers in 1908 and remained active in work of the association until his retirement in 1948.

—o—

Emil J. Miller, 64, vice president, secretary and comptroller, Sloan Valve Co., Chicago, died July 28 in Oak Park, Ill. He had been associated with the company 33 years, having joined it in 1916 as bookkeeper.

—o—

Irvin C. Kurth, 50, superintendent of Tar Products Division, Chicago plant, Koppers Co. Inc., died July 25 in Riverside, Ill.

—o—

Franklin L. Whitcomb, 87, retired president, Griffin Wheel Co., Chicago, died July 26 at his summer home in Cotuit, Mass. He had been associated with the company for 49 years prior to his retirement in 1938.

—o—

H. Erskine Campbell, 73, retired vice president and treasurer, A. M. Castle & Co., Seattle, died July 27.

—o—

James A. Rogan, 71, president and treasurer, Calumet Shipyard & Drydock Co., Chicago, died July 27.

—o—

L. H. McGowan, 61, chairman of the board, Standard Steel Co., Los Angeles, died July 28. He was also president of W. C. Meehanite Corp. and formerly was vice president of Hedges-Walsh-Weidner Co., Chattanooga, Tenn.

—o—

Charles Stewart, 64, president and chairman, A. C. Woods & Co., Rockford, Ill., died Aug. 1. He was also president of Central Fabricators Association, Chicago. Mr. Stewart joined A. C. Woods in 1939 after serving as general manager for Wierling Steel Works, Chicago.

—o—

Thomas A. Browne, 68, employment manager for A. Schrader's Son Division, Scovill Mfg. Co. Inc., Brooklyn, N. Y., died July 30.

—o—

J. H. Rowbotham, 63, who several years ago retired as treasurer of Belmont Iron Works, Philadelphia, died recently in Toms River, N. J.

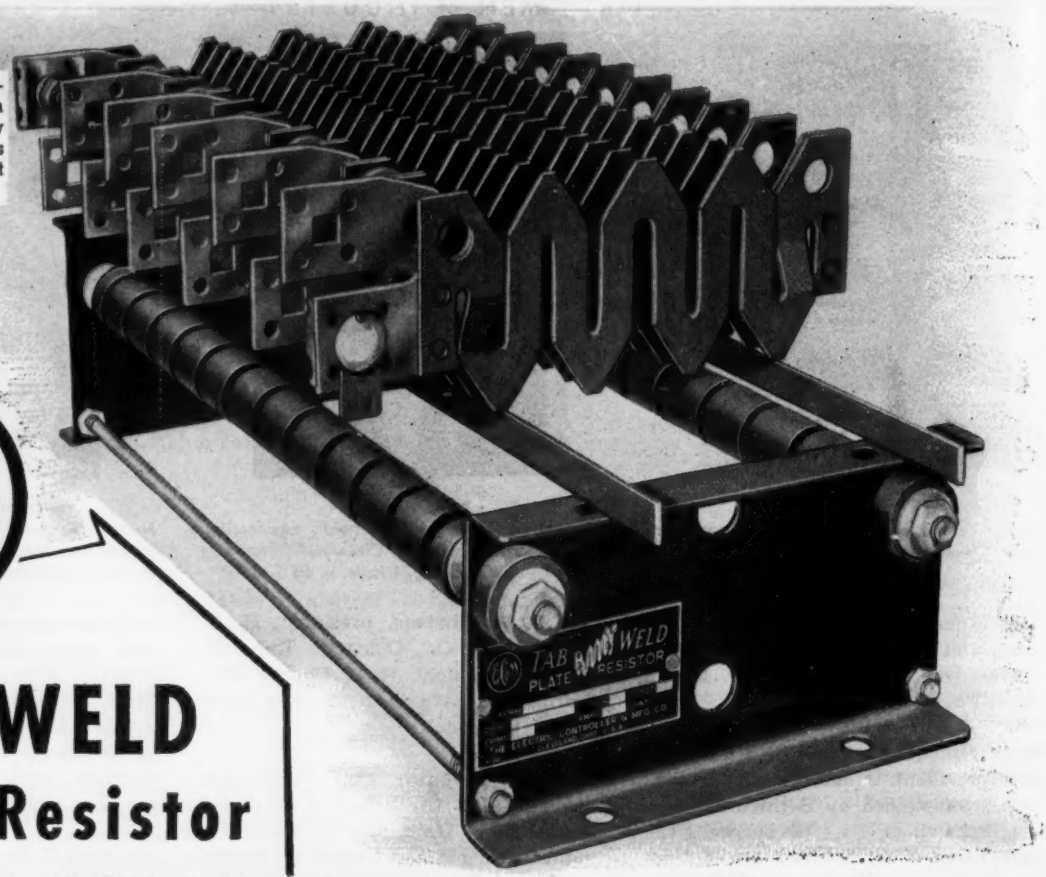
—o—

Raymond L. Ward, 52, assistant treasurer and controller of Curtiss-Wright Corp., died July 29 after a heart attack in his office in Wood-Ridge, N. J.

—o—

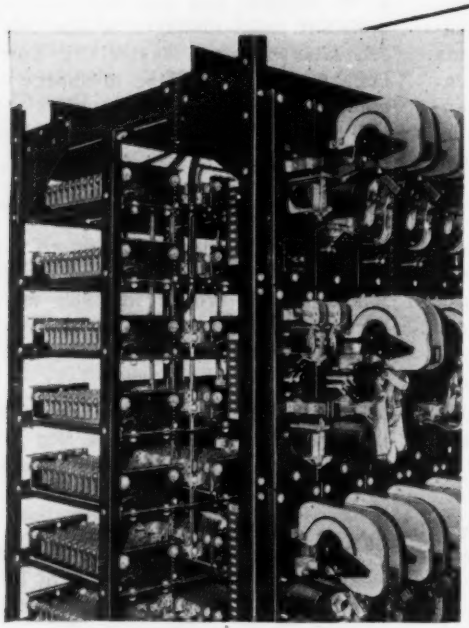
Ira S. Bushey, 50, vice president of Ira S. Bushey & Sons, Brooklyn, N. Y., died July 29.

The welded grid assembly is shown here as a unit resting on narrow iron straps above its end frame, support rods, and spacers.



TAB-WELD Plate Resistor

Steps Up RESISTOR Performance these 3 ways



TAB-WELD Resistors as part of Factory-assembled Control for recent Ore-Bridge Installation.

The *welded* grid-assembly of the EC&M TAB-WELD Plate Resistor reduces resistor maintenance costs and improves operation.

HERE'S HOW:

1. **Stabilizes** the Ohmic Value—A continuous path for current is maintained *independent* of the clamping-nuts.
2. **Stops burning** at grid-eyes and at tap-plates. Trouble is eliminated in these concealed areas due to *intimate* contact maintained by welding.
3. **Simplifies** Tap-Shifting—(a) when adjusting resistance to improve motor operation on an existing installation; (b) when necessary to replace a section, a standard mill section can be taken from the storeroom and used *without change* . . . External connections can be made to any one of the several tap-plates; only the external lead and terminal block need be moved to give the desired operation.

For low-cost, trouble-free operation, make up resistor layouts with EC&M Bulletin 942 TAB-WELD Plate Resistor Sections, made from corrosion-resistant steel.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Engineering News . . . AT A GLANCE

INSIDE "DAYLIGHT"—Problem of providing adequate "inside daylight" at its new plant at Tulsa, Okla., was solved by National Tank Co. with the use of translucent Fiberglas and plastic sheets for skylights and windows. The sheets, it is reported, admit sufficient natural daylight for most of the operations conducted in the plant. Their corrugations correspond to those of standard corrugated metal, and are installed in the same manner as corrugated metal sheets—without framework of any kind. Weighing about 8 ounces per square foot, the sheets are unaffected by climatic conditions, strong enough to sustain weight of a snowfall and will not readily ignite or support combustion.

LOCALIZED "SHEET CONSUMER"—Approximately 44,000 steel sheets, 0.014-inch thick were employed by General Electric Co., Schenectady, N. Y., to construct the magnet for the huge 160-ton, 100-million-electron-volt betatron recently shipped to the University of Chicago. Forty slabs, 20 of each size, make up the magnet core. Larger slabs, 7¼ x 180 x 39 inches, contain about 1700 sheets each, and small end slabs, 7¼ x 39 x 22 inches, contain about 500 sheets.

BONDS DISSIMILAR MATERIALS—Process for bonding dissimilar materials in parts designed to withstand extreme lateral or internal hydrostatic and aerostatic pressures is reported by Western Sealant Inc., Culver City, Calif. Primarily for bonding plastic or Neoprene to ferrous or nonferrous metals as in bushings or inserts used in aircraft, electronic, oil or hydraulic equipment industries, the process utilizes special equipment and a new bonding agent. A batch immersion method, it allows numerous parts to be processed simultaneously. The process, according to the company, also eliminates microporosity by impregnation with the bonding agent which has a wide range of resistance to operational temperatures and chemical solvents.

HEFTY SHORT CIRCUIT—Three giant graphite electrodes, which supply the melting heat in the massive 70-ton steel refining furnace recently placed in operation by Allegheny Ludlum Steel Corp. at Brackenridge, Pa., are reported to be charged with upwards of 16,000,000 watts of electricity. In other words, they release into a heating chamber smaller than an average hotel room sufficient electrical energy to supply all needs of a city of 25,000 population. The three phase current becomes effective in the furnace when the electrodes come in contact with cold or hot metal to be refined—the action being similar to a short circuit in a domestic electric line, except a fuse does not blow.

MANGANESE EXPERIMENTS SUCCESSFUL—Experimental use of electrolytic manganese in production of steel castings indicates that the material can be used successfully in acid steel foundry practice, and that its addition does not impair the quality of the steel, according to a publication released by the Bureau of Mines, Pittsburgh. To study the feasibility of substituting electrolytic manganese for ordinary grades of ferromanganese in steel castings, the bureau supplied the Sharon, Pa., plant of National Malleable & Steel Castings Co. with 750 pounds of the material—all of it produced by the bureau-developed method at the Boulder City, Nev., pilot plant.

SPECIALIZED JOB — Training an operator to be skillful in flame hardening operations requires weeks of practice and keen observation. Yet, unless he is occupied with a steady volume of work so that he can stay in practice and remain specialized, an operator soon loses his "touch". Color of the heated surface is the only guide for judging material temperature, it is pointed out. If an operator is occupied only periodically, and if shop lighting is too bright and not uniform, it will add up to one answer—overheated and burned steel. (p.64)

JAP STEEL INDUSTRY—In summing up the competitive position of Japan in the postwar market, Joseph Z. Reday, former chief of the industrial division of General MacArthur's staff, points out that the far eastern country will very unlikely become a serious competitor in the export of steel to far eastern markets. Japan, he states, can and should export machinery and other metal products, but it is not likely that she can meet competition costwise on rails, sheets, bars and other primary steel products once American and European mill prices prevail. (p.68)

ONE-MINUTE FINISHING — Pressurized spray painting operation employed by one company to recondition steel drums requires less than a minute, and is done just before the containers are sent through an infrared baking oven. Setup consists of a battery of automatic spray guns, each set to do a certain portion of the finishing job—in any color combination required. An electric revolving device is used to whirl the drums in front of the guns. Less than 60 seconds later the drums roll down a slight incline where "ice-tong" grippers automatically engage them, carrying them to a conveyor leading to the oven. (p.73)

STILL SLOW PROCESS — In describing methods used in hot dip tinning steel, Alfred E. Kadell, manager, tin plate department, Weirton Steel Co., reports that the entire operation compared with cleaning, temper rolling and cutting is very slow, even though present day tin stacks operate at a much higher rate of speed than they did a number of years ago. Common rate of operation, he points out, is about 35 feet per minute. (p.84)

VERSATILITY OF Oxyacetylene

...used to advantage by commercial heat treaters

By J. T. HOWAT
President
Pittsburgh Metal Processing Co. Inc.
Pittsburgh

For economy, flexibility and speed, few heat treating methods can handle the variety of parts now being processed by this highly successful technique

IN considering the problems of wear and failures in machinery, the bulk of such difficulties arise in moving parts. Wear is the primary failure in these moving parts: Gears, cam shafts, sprockets, sleeves, pinions, wheels, ways, tracks and guide faces. Concerning the design and construction of such parts, it should be understood that the contact or wearing surfaces comprise only a small proportion of the total surface area of the part, and only a far smaller proportion of the mass of the part. Further, however, these parts are subject to other service effects than wear. They must stand tension, torsion, compression, impact, bending and vibration, and in many cases corrosive actions as well.

In the replacement of failed parts, two general reasons for failure are generally present. One is wear. The contact surfaces fail because of insufficient hardness, overloading or lack of lubrication. The other reason is fracture resulting from fatigue, poor design, lack of suitable strength in the material, or residual stresses from fully quenched heat-treatment.

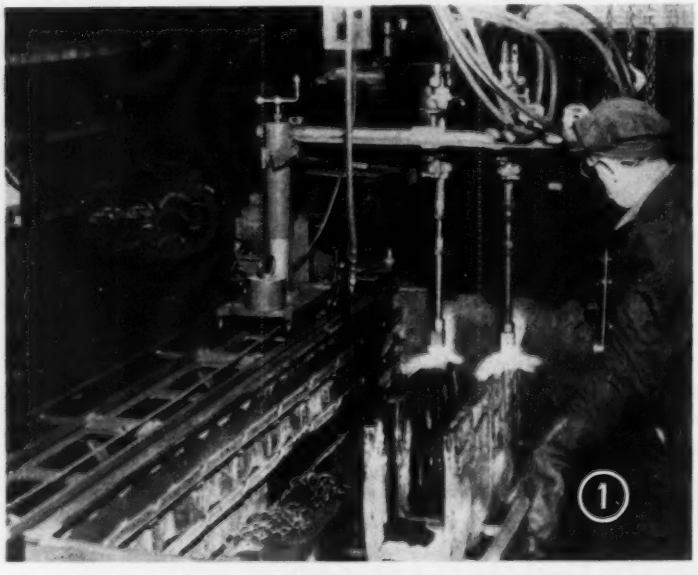


Fig. 1—Flame-hardening two parallel surfaces of locomotive spring saddle, using two torches

With the demand for more compact equipment of steadily increasing load capacity, the need to prepare these contact surfaces has been of growing vital importance. The job can be done with any of the following processes: Standard full quench heat treatment, localized case hardening, nitriding, chapmanizing, induction hardening, hard-facing, hard chrome plating, metallizing, flame hardening. For economy, flexibility and speed, few processes can handle the variety of work with the success that flame-hardening does today.

Standard 1 and 2 flame tips were used in 1925 when this company first used flame-hardening methods. Soon water-cooled equipment was needed to meet the demand for hardening large areas, and the successful results obtained with the process created a steady natural demand for more elaborate equipment. Today, there are on the market several machines to do fully automatic, mass-production flame-hardening; and in most large steel mills, and in gear, machine and maintenance plants, well-equipped flame-hardening departments have been set up.

Flame hardening is also an essential department of the fully equipped commercial heat-treating company. For the small or average shop there is an important question of whether or not they should establish their own heat-treating for flame-hardening operations. The cost of equipment for such a flame-hardening setup is not great. A standard torch, a few tips, a standard portable-type cutting machine and a discarded lathe or drill press will provide for a wide variety of flame-hardening work. On the other hand, the fact should not be overlooked that this process depends to a large extent on the operator's skill, unless an expensive automatic machine is employed.

Planning Flame-Hardening Operation—Many weeks are required to train an operator to insure consistent, uniform results. Competent metallurgical personnel are also required to insure correct decisions on materials and treatments. There should be an assured steady volume of work for the operator, so that once he has been successfully trained he can keep in practice and stay specialized in this highly specialized work. As the color of the heated surface is the only guide for judging the temperature of the material, shop lighting conditions must be adapted to suit. They should always be the same, with uniform lighting and slightly shaded for preference, as excess

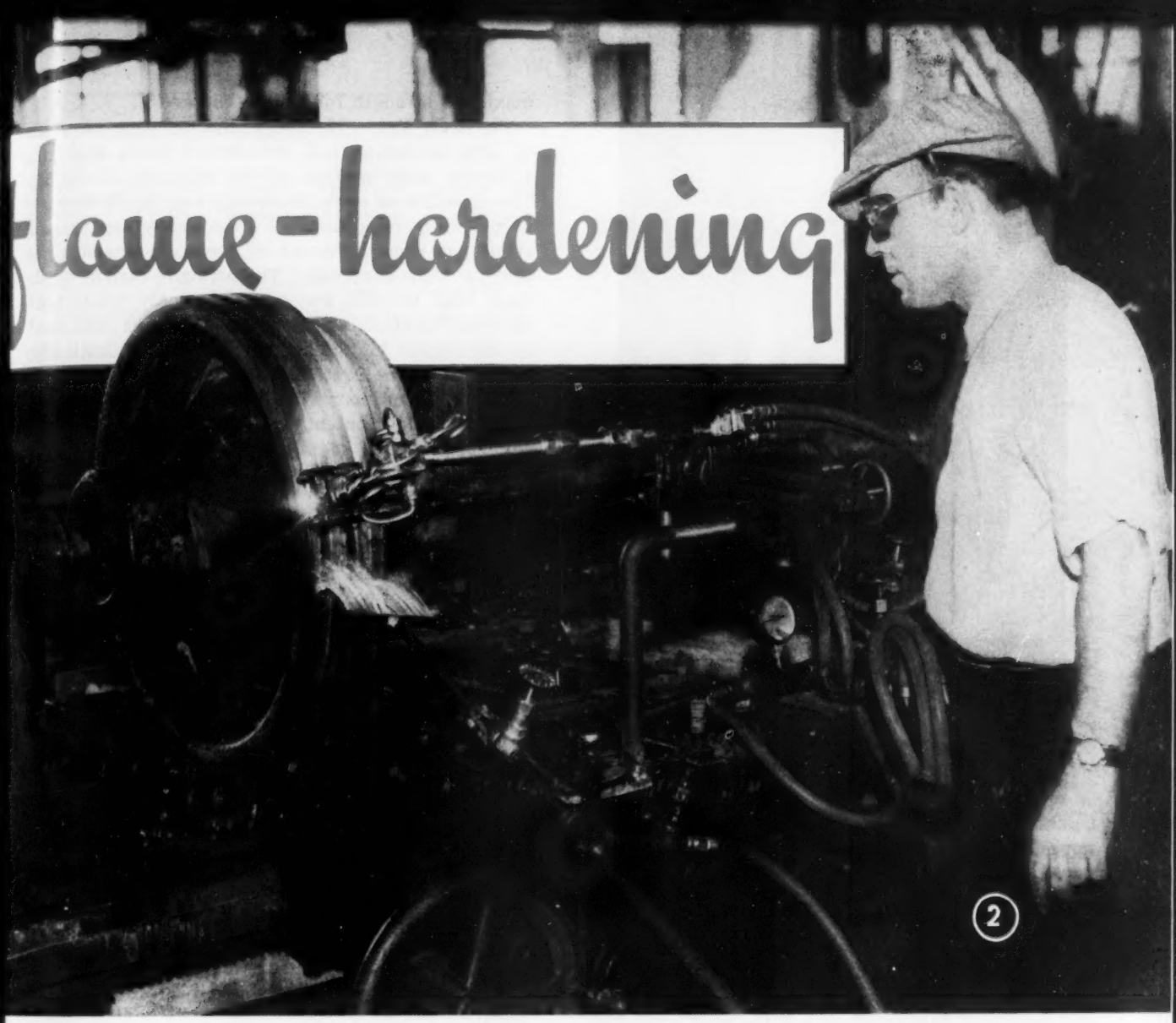


Fig. 2—Rotary operation, with special multiflame groove-hardening tip, on walls of grooves in a piston head ring

brightness, such as sunlight, can lead to overheating and burning the steel.

These and other considerations must be kept in mind in planning for a flame-hardening operation, and they tend to discourage any but a full-fledged production arrangement. On the whole, this is as it should be, for heat-treating, by any means, is something of an art; and it is a good guiding principle to leave it in the hands of experts, either in your own shop or in a commercial heat-treating establishment.

Fuel Gases—With any flame-hardening setup, the procedure questions tend to start with a choice of fuel gases. Two factors govern this choice—economy and quality of the results. Low-pressure natural gas and liquid petroleum gases have too low a flame temperature for flame-hardening. Natural gas under high pressure with suitable burners, and oxygen, sometimes with propane added, have been used. A very satisfactory flame-hardening job can be done with hydrogen and oxygen. Generally, however, acetylene is the nearest thing to an ideal fuel gas for flame-hardening, and its use is so well founded that it can be accepted as the basic fuel gas for the process.

Acetylene, burned with oxygen, provides the highest commercially available flame temperature, and along with that characteristic, it also provides the best controllability, not only in establishing suitable flame characteristics, but in duplicating them as often as required. Commercial acetylene is consistently pure and reliable, readily available, and with its uniformity, predictability and operating characteristics, provides the most practical and economic means of doing most flame-hardening work. Generally, acetylene is used at 15 psi in proportion of 1 cu ft to 1.1 cu ft of oxygen at 14 psi in a neutral flame. Increase of oxygen pressure results in danger of overheating with subsequent sweating of the surface.

Costs—As in all processes, one of the primary questions is cost. There are several factors that control the cost of heat-treating with oxyacetylene flame, some of which differ from factors involved in other methods. They include: Depth of hardness required, ratio of treated area to total mass, analysis of the steel used, cost of oxygen and acetylene single cyl-

From data presented by the author before the annual meeting, International Acetylene Association, Pittsburgh, April 25-26, 1949.

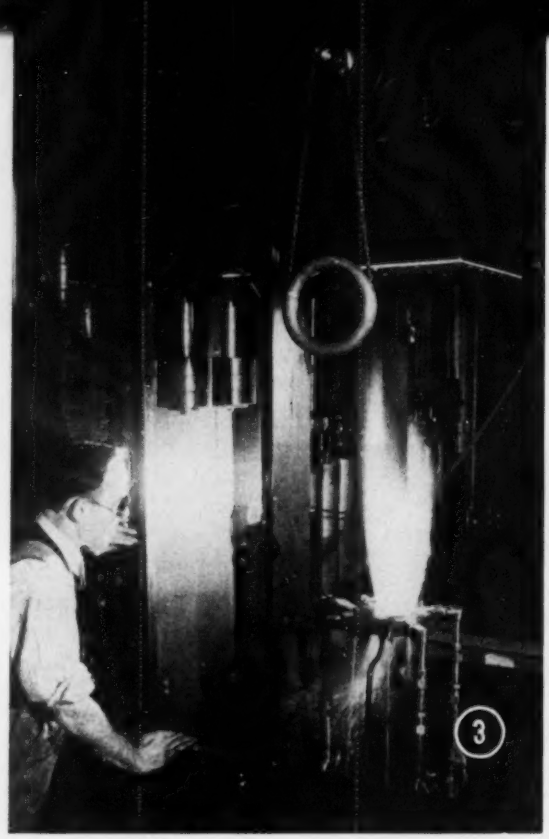


Fig. 3—Flame-hardening a 4-inch diameter shaft in a vertical flame-hardening machine equipped with annular tip assembly

inders, manifolds, generated acetylene, method of work—hand or machine, type of tip and speed of torch travel.

Data in Table I will give an idea of gas consumption to be expected and, of course, we must add to this the cost of labor and setting up for the job. Generally, a comparison with other methods of accomplishing similar results on suitable work pieces will show that flame-hardening is the most economical way to operate. In other cases, where economy may not show up so well, it may be cheaper in the long run because of superior character or quality of the results.

In these latter cases particularly, flame-hardening is advantageous because of its high degree of controllability. Depth and area of the hardened surface, heat-treating only the exact sections of the part which require it can be controlled precisely. While this can be done sometimes by other methods, it is often only with great difficulty and expense; and it can only be accomplished by flame-hardening on large or complex parts, whereas with the torch it becomes a relatively simple and inexpensive procedure. In any case, flame-hardening comes very close to meeting the ideal in parts which must provide very hard wearing surfaces on a tough ductile body with a good transition zone to the body of the part which retains maximum strength for loading in service.

Physicals Vary—Naturally, the resulting physicals in both hardening and unhardened zones will vary with the basic analysis of the material (Table II). The question of what materials can be flame-hardened is very important. We can safely say that all steels and irons hardened by furnace processing can also be flame-hardened. The straight carbon steels, SAE 1035 to 1050 are most commonly used; next, the pearlitic steels and medium-alloy steels; and finally the regular high-alloy steels. With the high-alloy steels, the same precautions must be used as would be needed in ordinary furnace heat-treating. That is, when the alloy content, is raised over 1.75 per cent, the steel should be slightly preheated. In actual practice, a saving of 20 per cent in time can be made by preheating not only high alloy but all work before flame-hardening.

Degree of quenching must be determined according to the design and analysis of the part. For maximum quench of some items, a water pressure of 60 to 100 pounds will be used—in other cases, the quench is reduced to a fine air-water spray, or even soluble oil or still air. The work should never be quenched to dead cold, and a drawing treatment should be given where possible. A residual temperature of around 300° F should be left in all work. Depth of hardness at all corners should be reduced to eliminate cracking, and to prevent overheating of the work, we must avoid too vigorous heating or having the tip too close to the surface. This distance may vary from ⅛ to ½-inch depending on material, design and depth of hardness desired. If extra depth is required—say more than about 3/16-inch—it is best to pull the tip slightly further away from the surface, but not more than ½-inch. This allows time for deeper penetration of the heat without overheating of the surface metal.

Heat Treating Defects—Since, in flame-hardening a very high-temperature heat source is being applied to a concentrated local area, nature of the process makes possible several typical heat treating defects unless proper measures are taken to prevent them.

Grain structure of the steel will also affect the results. It is always preferable to use fine-grained

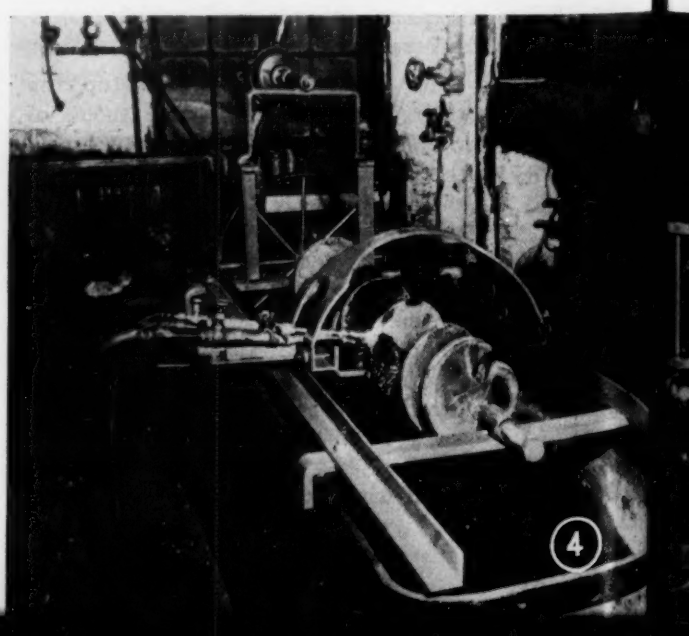


Fig. 4—Stoker elevator screw flame-hardened along edge of flight. Flames are moved along the part by rotation of the screw against contact bar on the torch carriage

Fig. 5—Flame-hardening a bevel ring gear on a gear flame-hardening machine

Fig. 6—General view of a special machine built for production flame-hardening of precision dies

TABLE I
OXYACETYLENE FLAME-HARDENING COSTS

Approximate* Depth of Hardness Penetration in Inches	Torch Travel Speed per min. in Inches	4-in Tip Coverage Sq. In. Per Minute	Cu. Ft.** Acetylene Consumption Per Sq. In. of Surface	Cu. Ft.** Oxygen Consumption Per Sq. In. of Surface
5/16	2	8	0.55+	0.61—
1/4	3	12	0.37—	0.40+
3/16	4	16	0.28—	0.30+
1/8	5	20	0.22+	0.24+
1/16	6	24	0.18+	0.20+

* Depths subject to variation with the thickness of the object heated.
** Based on using 4 in.-wide tip.
If a 3 in. wide tip is used—add 10 per cent to gas consumption.
If a 2 in. wide tip is used—add 15 per cent to gas consumption.
If a 1 in. wide tip is used—add 20 per cent to gas consumption.
Other sizes proportionately.

TABLE II
TYPICAL PHYSICALS AFTER FLAME-HARDENING

C	Mn	Cr	Ni	Mo	Elastic Limit (psi)	Tensile Strength (psi)	Izod Impact (ft.-lb.)	Brinell on Core	Brinell on Surface
0.18	0.47	...	1.64	0.24	105,000	120,000	62	250	477
0.33	0.62	0.64	1.52	...	110,000	130,000	75	...	534
0.34	0.61	...	1.75	0.25	175,000	185,000	35	...	555
0.35	0.68	0.93	...	0.21	160,000	130,000	65	...	627
0.36	1.92	...	...	...	115,000	124,700	60	255	415
0.42	0.56	0.83	...	...	135,000	150,000	48	325	495
0.42	0.69	0.97	...	0.18	130,000	147,000	40	350	514
0.42	0.83	...	...	...	75,000	105,000	27	...	514
0.43	0.57	...	3.60	...	125,000	135,000	69	...	578
0.47	0.68	...	...	...	85,000	115,000	..	258	541

TABLE III
ALLOY CAST IRONS

Classifications	ANALYSIS T.C.	Gr.C.	C.C	Mn	Si	Cr	Ni	Mo	BRINELL HARDNESS* Before Flame-Hardening	After Water Quench
Nickel	3.46	2.78	0.68	0.71	1.28		1.08		215	507
Nickel	3.13			0.86	1.84		1.43			514
Nickel	2.84			0.91	1.42		1.47			495
Nickel	3.24			0.57	1.19		1.50			514
Nickel	3.22			0.67	1.76		1.61			514
Nickel-Chromium	3.01	2.60	0.41	0.79	2.21	0.42	1.07			470
Nickel-Chromium	2.95			0.81	1.67	0.33	1.28			514
Nickel-Chromium	2.87			0.85	1.66	0.29	1.57		217	550
Chrome-Moly	3.19	2.50	0.69	0.76	1.70	0.03		0.01	217	436
Chrome-Moly	3.19	2.57	0.62	0.81	2.28	0.37		0.23	187	525
Chrome-Moly	2.85	2.26	0.59	0.76	2.04	0.29		0.30	192	555
Chrome-Moly	3.22	2.57	0.65	0.75	1.73	0.03		0.47	223	555
Chrome-Moly	3.20	2.62	0.58	0.64	1.76	0.01	Tr	0.48	223	578
Nickel-Chrome-Moly	3.00			0.75	2.25	0.20	0.20	0.35	225	540
Nickel-Chrome-Moly	3.36	2.75	0.61	0.74	1.96	0.35	0.52	0.47	235	524
Nickel-Chrome-Moly	3.21	2.61	0.60	0.67	2.24	0.50	0.06	0.52	235	534
Nickel-Chrome-Moly	3.22	2.69	0.53	0.66	2.02	0.02	1.21	0.52	241	524

TABLE IV
MEEHANITE IRONS

ANALYSIS T.C.	Gr.C.	C.C.	Mn	Si	Cr	Ni	BRINELL HARDNESS* Before Flame-Hardening	After Water Quench
2.65	0.56	2.09	0.63	1.01	0.24		367	518
2.77	2.08	0.69	0.91	1.82	0.10	0.16	253	472
2.88	1.92	0.96	0.72	1.42	0.11	Tr	350	560
2.94	2.30	0.64	0.84	1.58	0.08	0.07	292	450
3.10	2.61	0.49	0.67	1.91	0.06		241	472

TABLE V
PEARLITIC MALLEABLE IRONS

ANALYSIS T.C.	Gr.C.	C.C.	Mn	Si	BRINELL HARDNESS* After Water Quench
2.30	1.80	0.50	0.95	0.98	401
2.65	2.15	0.50	0.40	1.25	525

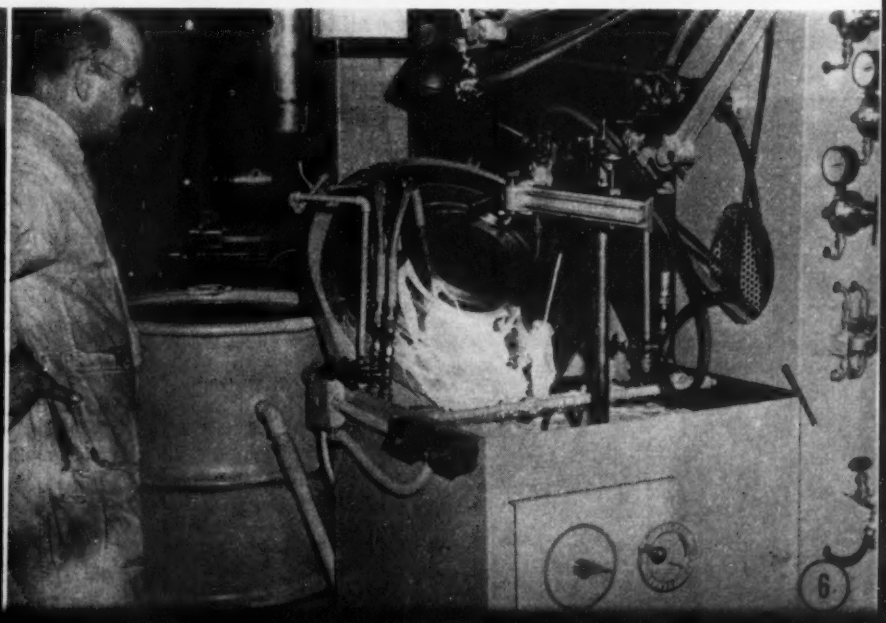
* Hardnesses as shown in Tables III, IV and V are not indicative of maximum hardness obtainable but are representative of flame-hardening results using varying quenching rates to meet specific hardness specifications.

steels, as their inherent resistance to grain growth in overheating is an advantage, as well as their shallow-hardening characteristics which are often desirable. With coarse-grained steels, if the surface becomes overheated by the flame, further enlarging of the grains may be caused, resulting in possible surface checking of the metal. Improper analysis of metal, as well as over-quenching, will also produce surface checks.

Where the thickness of the areas being hardened varies, or a sharp corner is reached, heating and quenching must be regulated to reduce the hardness in depth or degree in proportion to the thickness of the metal.

In most flame-hardening applications, the area being heated and quenched is a very small portion of the total mass. This, combined with the fact that the amount of heat imparted to the steel and which must be removed to get full quench, is kept to a minimum, means that the maximum possible hardness from a given analysis of steel or iron in the treated area is obtained.

Great difference between furnace and flame-heated work, in the amount of heat to be dispersed by quenching of the piece, is one reason for the success of the flame-hardening process. In many cases, with furnace treatment, it has been necessary to use alloy steels to obtain the nec- (*Please turn to Page* 94)



What's left of JAPAN'S IRON AND STEEL

Hampered by occupation restrictions and severe raw material shortages, Japan's iron and steel-producing facilities are operating at far less than 50 per cent of their approximately 7 million ton capacity. In this timely article, the author appraises the current status and future competitive position of the industry in terms of physical and economic realities

The Author

For nearly 3 years, Mr. Reday served as chief of the industrial division of General MacArthur's staff. Since June, 1948, he has been engaged in trading and engineering work in Japan, and holds the only postwar consulting engineering license in that country.

LIKE all industrial nations, Japan's economy revolves around steel. Unlike other major producers, however, the Japanese steel industry is completely dependent upon overseas raw materials—iron ore and coking coal from China and Southeast Asia and scrap from the United States.

The steel core of Japanese industry was a remarkably small one for the big war on which she embarked in 1941—too small as it turned out. Maximum production in the Japanese home islands was under 8 million tons of ingot, and for the whole empire probably didn't exceed 10 million tons in the peak war year of 1943. During the same year the United States produced nearly 80 million tons, Great Britain 13 million, France 5 million, Germany 21 million, Russia 12 million.

Japan's overseas sources of raw materials also proved much too insecure for war. Imports of iron ore dwindled from over 5 million tons in 1941 to 144,000 tons in 1945. Coal imports, a good deal of which consisted of coking coal for metallurgy, fell from nearly 7 million tons in 1940 to a mere 36,000 tons in 1945. Scrap imports all but ceased with Pearl Harbor, a fact which was reflected by the shift from a 65 per cent scrap, 35 per cent pig iron furnace charge to a 30 per cent scrap, 70 per cent pig iron charge in the course of the war.

The cities of Japan when we entered were an object lesson in the vital position of steel in modern warfare. Bank windows were protected by bars of wood, nearly all elevators had been removed from office buildings and radiators and pipes had been torn out of homes and public buildings alike. Steel had gone to war, and the war had been lost for lack of it as well as other metals and fuel.

Fig. 1—View of Japanese open hearth shop

Domestic Raw Materials—While Japan has deposits of iron ore, they are inadequate and high cost producers. The ores generally are not suitable for furnace charging unmixed by reason of high sulphur and phosphorous content and the necessity for sintering and other beneficiating which results in an excessive charging of fines. In practice, domestic ores are mixed with imported ores, the ratio depending upon the trade balance and ability to purchase ores from overseas. The prewar average was about 15 per cent domestic ore.

Total proved reserves of workable iron ores probably do not amount to more than 10 million tons, with an iron content of perhaps 40 per cent. Most of the domestic ores are contained in the magnetite deposit at Kamaishi in northern Honshu and the limonite bog iron deposit in Hokkaido.

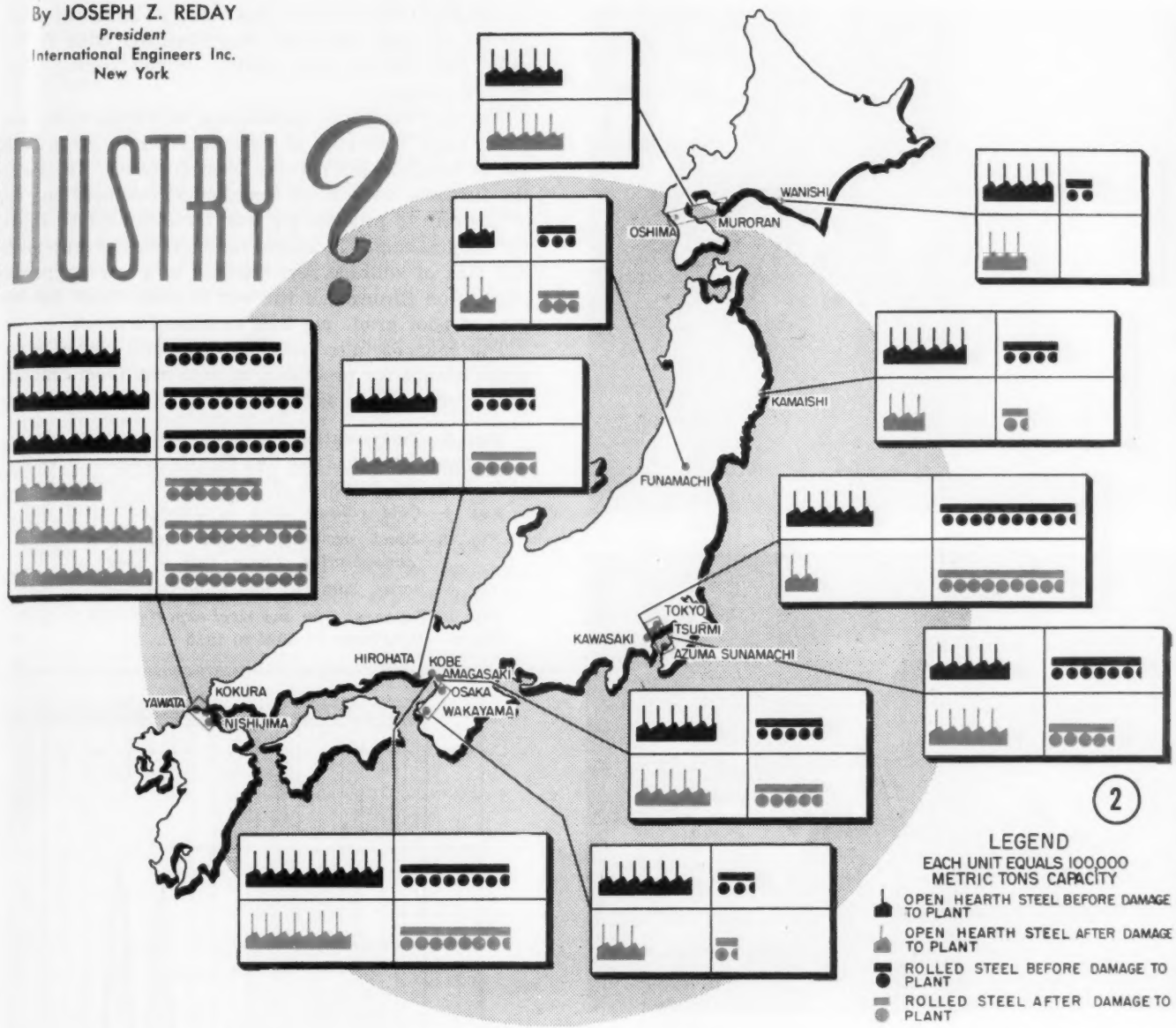
Peak output of domestic ore was about 3.5 million tons in 1944, with an iron content of about 1.5 million tons. Over 750,000 tons of iron sands were mined in the same year.

Japan is better supplied with coal, producing more than 50 million tons a year during the war. Such production would be adequate in quantity for peacetime needs, but quality is deficient for iron and

Fig. 2—Steel production capacity in major areas before and after damage to Japan

By JOSEPH Z. REDAY
President
International Engineers Inc.
New York

...INDUSTRY?



steelmaking because of low coking strength and high ash content. Japanese practice has been also to mix domestic coking coal with imported coal, the ratio again depending upon availability of imports. The average resulting coke yield in prewar years was about 60 per cent.

Manganese ore and most other ferroalloy ores are deficient in Japan and must be imported, as must fluorite. The country has adequate supplies of limestone and dolomite, but is an importer of magnesite both for charging and for making firebrick.

Japan was a fairly large importer of pig iron before the war, both from Korea and Manchuria in the empire, and from India and the United States. She also imported steel and steel products, mostly ingot, billet, sheet bar and slab. The net import balance of both pig iron and steel depended on favorable terms of trade since the prewar empire was largely self-sufficient in capacity.

Production Facilities—Nearly all of the iron and steel industry of the home islands is concentrated in four areas, northern Kyushu, Osaka, Tokyo-Yokohama, and northern Honshu-Hokkaido. The Kyushu installation, mostly the plant of Yawata, is based on nearby coal, while that in northern Honshu and Hokkaido is located at the sources of domestic ore. Both the Osaka area and the Tokyo-Yokohama area are completely dependent upon materials brought in either from overseas or from the domestic producing areas.

More than 90 per cent of the pig iron is produced in large blast furnaces in integrated plants. Most carbon steel is produced in open hearth furnaces, with the exception of one Bessemer installation which has five 20-ton Thomas converters. There is a large electric furnace capacity which before and during the war was used mostly for alloy steel production. All plants use vertical slot, Koppers type coking ovens, and all blast furnace facilities have by-product plants. The prewar steel production pattern was about 90 per cent rolled products, about 6 per cent castings and 4 per cent forgings.

In the production of pig iron, Japan had a peak installed capacity rated at 17,850 tons per day, most of it in over 200-ton-per-day furnaces. Both furnaces and furnace practice are modern and adequate

technically. The industry has suffered from the great variety of ores used and experimented with in the past, plus the varying quality of the coking coals made available.

Wartime need and dependence of Japan upon far-flung empire sources of materials led to large scale use of small 20-ton-per-day blast furnaces. In theory the furnaces were to be installed at overseas sources of iron ore to produce pig iron for shipment to Japan for steelmaking. Technical difficulties, wartime haste and lack of suitable fuel resulted in a low aggregate production throughout the war of only about 400,000 tons of poor grade pig iron in these furnaces.

The Japanese also installed eight kiln plants in the home islands for producing sponge iron from limonite and iron sands, plus two additional plants in Asia:

Fig. 3—This rotating drum at the Yawata plant of Japan Iron & Steel Co., Kyushu, Japan, is used to test the hardness of coke. U. S. Army photo

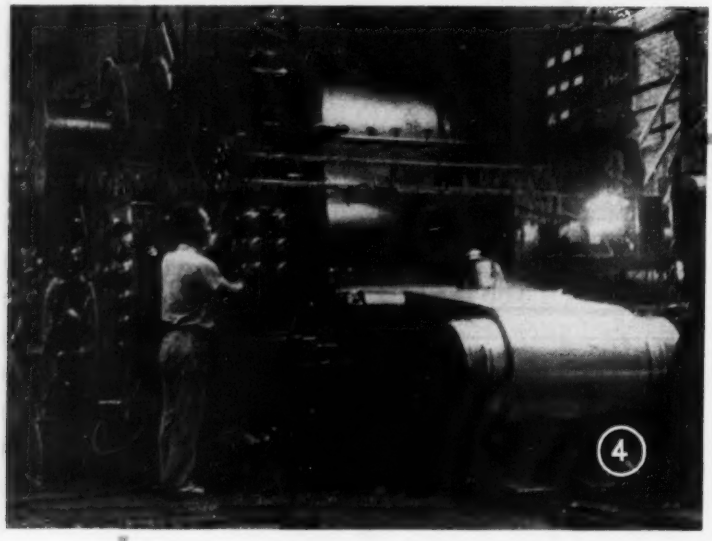


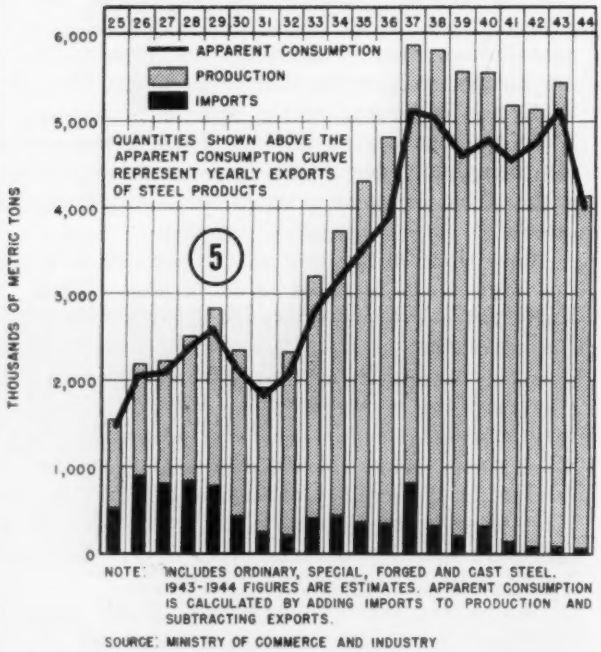
Fig. 4—Cold rolling strip in Japanese steel mill

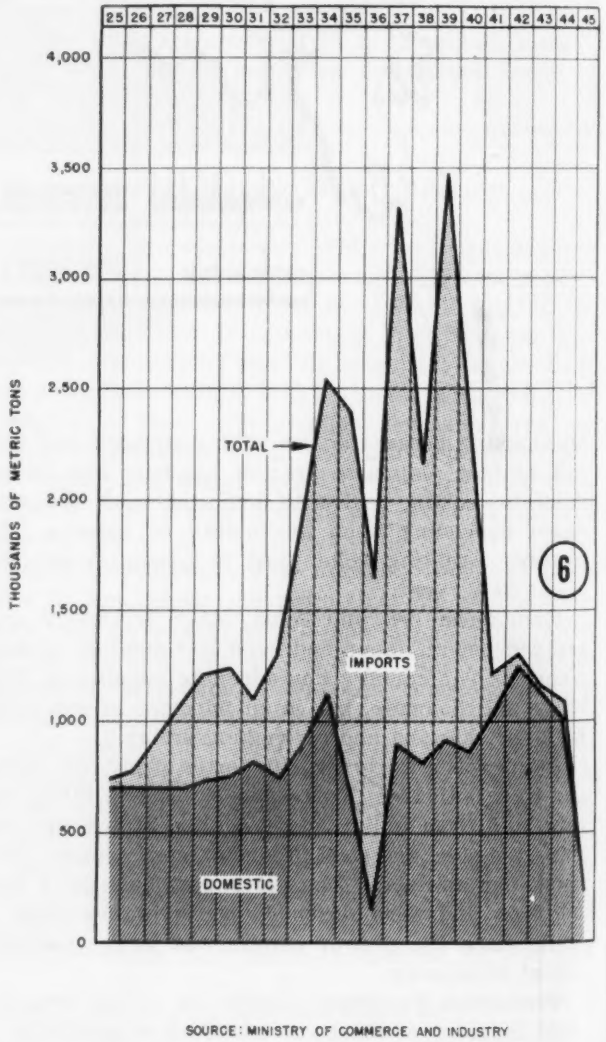
Fig. 5—Steel products, production, imports and consumption, Japan, 1925 to 1944

Fig. 6—Scrap, domestic and imported, 1925 to 1945

Fig. 7—Japanese iron and steel exports, 1925 to 1945

Fig. 8—Steel imports, 1925 to 1945


25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
APPARENT CONSUMPTION
PRODUCTION
IMPORTS
QUANTITIES SHOWN ABOVE THE APPARENT CONSUMPTION CURVE REPRESENT YEARLY EXPORTS OF STEEL PRODUCTS
5
THOUSANDS OF METRIC TONS
6,000
5,000
4,000
3,000
2,000
1,000
0
NOTE: INCLUDES ORDINARY, SPECIAL, FORGED AND CAST STEEL. 1943-1944 FIGURES ARE ESTIMATES. APPARENT CONSUMPTION IS CALCULATED BY ADDING IMPORTS TO PRODUCTION AND SUBTRACTING EXPORTS.
SOURCE: MINISTRY OF COMMERCE AND INDUSTRY



Peak output was about 100,000 tons in 1944. They also experimented with batch production of pig iron in electric furnaces. Total output aggregated about 65,000 tons.

In the production of steel, Japan has an open hearth furnace installation of 193 furnaces with a rated capacity of nearly 7.5 million tons of ingot a year based on 680 heats. Furnaces run from 10 to 200 tons per charge and can produce any type ingot required. Furnaces are modern, of American and German design and technology is adequate. Wartime production pattern was about 85 per cent ordinary steel and 15 per cent alloy.

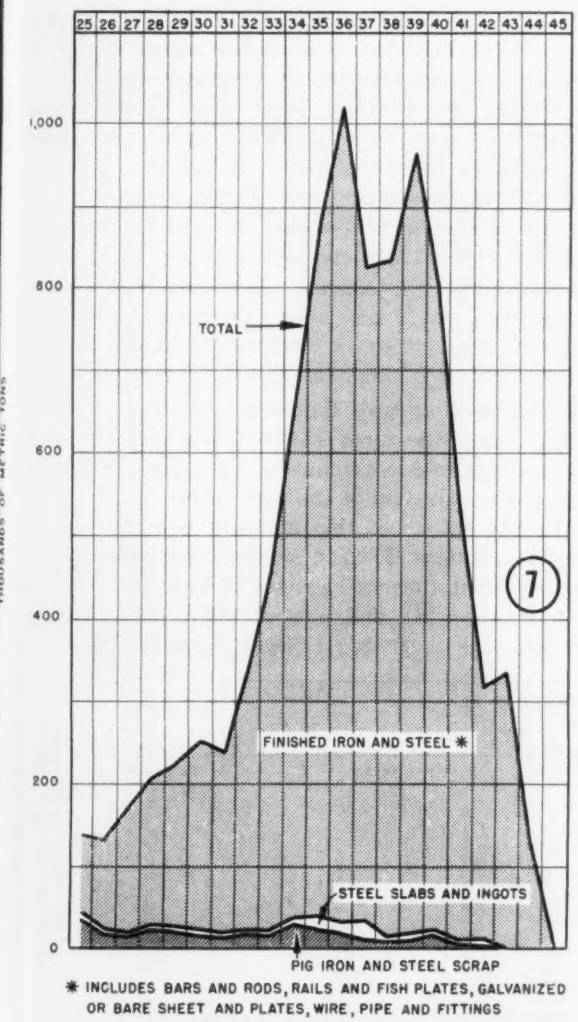
Open hearth furnace practice follows that in the United States, usually charging the scrap followed by hot pig iron, with fluxes added during the heat.

The Thomas converters of the Kawasaki plant of the Japan Steel Tube Co. were installed primarily to utilize high phosphorous pig iron from domestic ores. The plant has been valuable also as a source of fertilizer from the high phosphate slag.

Japan in addition has a rated capacity of about 2 million tons per year in electric furnaces, of which there are 440, the majority Heroult type of 1 to 20-ton charge. Induction type electric furnaces are also used extensively especially in the smaller shop operations. Electric furnaces suit Japan, both by reason of cheap hydro power and because of the general, all-purpose nature of the typical Japanese small plant. By the latter part of the war, nearly one third of Japan's steel output came from electric furnaces.

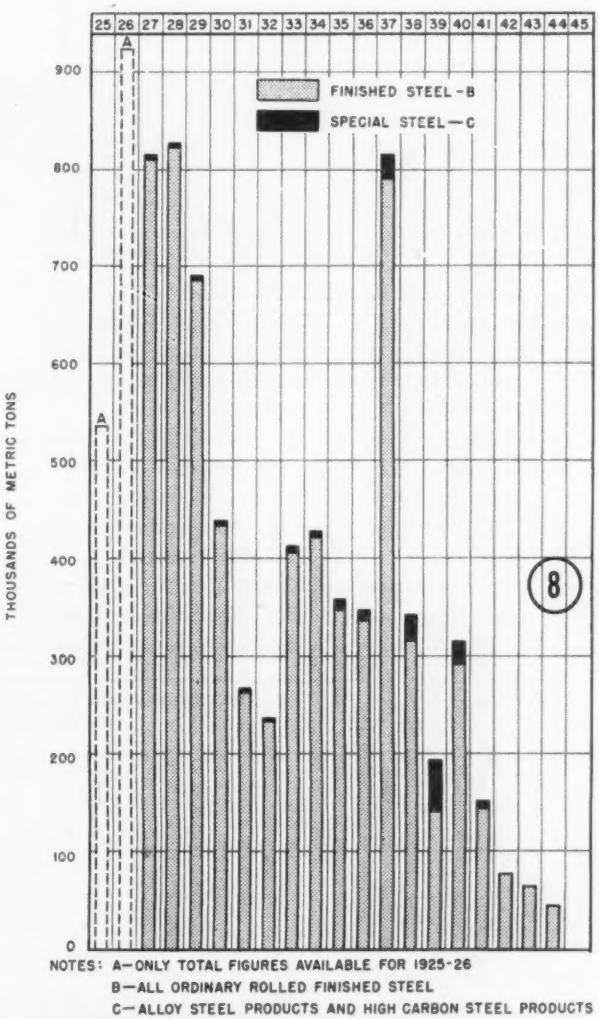
Rolling Mills—Japan's steel rolling and fabricating industry is adequate both in size and in quality of equipment for any modern purpose. Chiefly of American and German design and in many cases of American or German manufacture, the industry can turn out anything from nails to battleship plate. Technology is not up to the equipment.

Major steelmaking center in Japan is that of Yawata in northern Kyushu. The oldest plant in the country, it has been added to over the past 65 years and now contains about one third of the pig iron and steel ingot capacity of Japan. It has 12 blast furnaces, 46 open hearth furnaces, 13 electric furnaces, 7 blooming mills and 2 rolling mills, one of which is a continuous strip mill made by United Engineering. Yawata can turn out any type product except pipe, and is the only facility in Japan for producing rails.



* INCLUDES BARS AND RODS, RAILS AND FISH PLATES, GALVANIZED OR BARE SHEET AND PLATES, WIRE, PIPE AND FITTINGS

SOURCE: MINISTRY OF COMMERCE AND INDUSTRY



NOTES: A—ONLY TOTAL FIGURES AVAILABLE FOR 1925-26
B—ALL ORDINARY ROLLED FINISHED STEEL
C—ALLOY STEEL PRODUCTS AND HIGH CARBON STEEL PRODUCTS

SOURCE: MINISTRY OF COMMERCE AND INDUSTRY

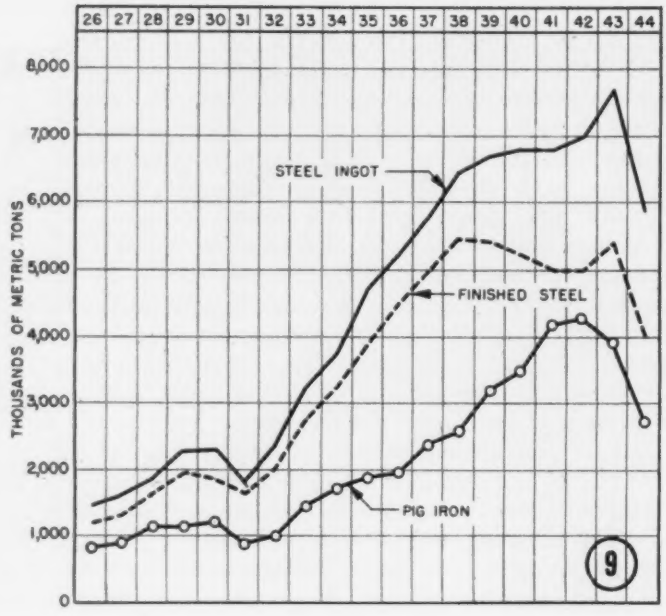


Fig. 9—Iron and steel production, Japanese mainland

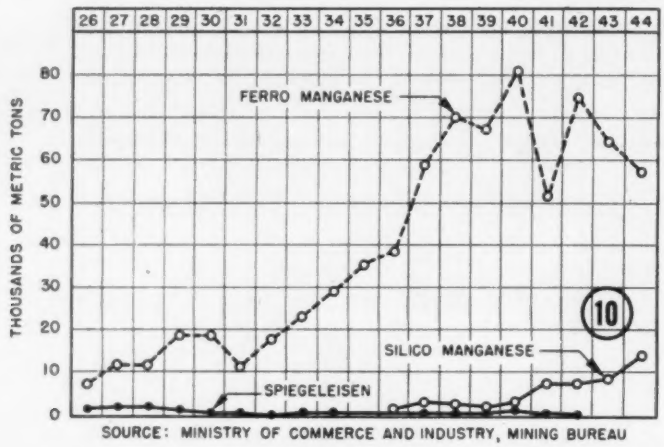


Fig. 10—Mangano-alloy production, Japan 1926 to 1944

Kamaishi in northern Honshu was started about the same time as Yawata. It has three blast furnaces, ten open hearth furnaces, three electric furnaces, one blooming mill and six rolling mills. It normally produces mostly pig iron and semifinished steel.

Wanishi in Hokkaido was begun in 1909 as the first privately constructed plant. It has seven blast furnaces, five open hearth furnaces, one blooming mill, one bar mill and one wire rod mill. Its production is taken in form of pig iron, steel billets, wire rod.

Steel center of Kawasaki and Tsurumi in the Tokyo-Yokohama area is owned by the Japan Steel Tube Co. Like Yawata it has been added to over many years. It has seven blast furnaces, 20 open hearth furnaces, five Thomas converters, two blooming mills, one bar mill, one wire rod mill, three tube mills, one sheet bar mill, three plate and sheet mills and one slab and plate mill. Sometimes called the Youngstown of Japan, this plant is one of only two pipe mills in the country and the only source of large size pipe.

Most Modern Plant—The Hirohata plant near Osaka is the best and most modern plant in Japan, if not the entire Far East. Started in 1937, it has never been completely finished. It has two 1000-ton blast furnaces plus six 150-ton open hearth furnaces and the largest continuous plate mill in Japan. The plant was designed for fully integrated operation and was primarily intended to produce ship plates. A section steel mill was manufactured but not erected at the end of the war. Most of the equipment in the Hirohata plant is of American and German design. The blooming mill, billet mill, plate mill and the section steel plant were all purchased by the Japanese in the United States and Germany.

In addition to the above plants and others in the home islands, the Japanese also installed a fairly sizable industry in Korea and Manchuria. That in Korea is located in the Soviet north, and presumably most of that in Manchuria has been either stripped by the Soviet or made inoperative by continual fighting.

In Korea, the Kenjiho plant near Heijo is the largest with a capacity of 350,000 tons of pig iron per year plus open hearth capacity of 400 tons per day. The Mitsubishi plant also near Heijo, which was not completed at the end of the war, had a design capacity of 180,000 tons of ingot per year.

In Manchuria, the Anshan plant was built largely by American engineers with American equipment. It had a peak output in 1943 of 1,325,000 tons of pig iron and over 350,000 tons of steel products.

Disposition of Japan's Industry—The iron and steel industry being the most basic of industries has received a considerable amount of high policy attention in Japan since the end of the war. First recommendation for the future of this industry was that of the U. S. Reparations Mission calling for Japan to be allowed a blast furnace capacity of only 500,000 tons of pig iron a year and a steel ingot production of 2,250,000 tons a year. (*Please turn to Page* 94)

MATERIALS FOR STEEL PRODUCTION IN JAPAN
(In 1000 Metric Tons)

	Iron Ore (Iron Content) — Imports								Pig Iron — Imports					Pig Iron — Scrap				Steel Ingots — Production			
	Production Home Islands	Korea	Manchuria	China	Philippines	Malay	Others	Total	Production Home Islands	Korea	Manchuria	Others	Total	Production Plus Imports	Domestic	Imports	Total Available	Home Islands	Korea	Manchuria	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		(17)	(18)	(19)	(20)
1930									1,162							489					
1931	103								1,102	95	242	158	495	1,412		296		1,883			1,883
1932	115								1,102	206	322	122	650	1,752		559		2,398			2,398
1933	160								1,437	160	455	186	801	2,238		1,013		3,198	5		3,203
1934	215								1,728	164	409	205	778	2,506		1,413		3,844	60		3,904
1935	260	121	0	757	0	929	381	2,448	1,865	131	383	579	1,093	2,958		1,692		4,704	97	137	4,938
1936	309	121	0	751	0	1,066	466	2,713	1,972	123	271	701	1,095	3,067	648	1,497	5,212	5,223	87	344	5,654
1937	296	151	1	358	0	1,029	1,015	2,850	2,252	135	213	793	1,131	3,383	904	2,420	6,707	5,801	103	451	6,355
1938	364	184	2	88	0	1,008	624	2,270	2,467	215	210	647	1,072	3,539	815	1,358	5,712	6,472	106	622	7,200
1939	447	200	7	411	0	1,220	1,090	3,375	3,068	221	352	352	927	3,995	919	2,555	7,469	6,696	112	562	7,370
1940	557	220	28	705	0	1,286	813	3,609	3,417	164	431	259	854	4,271	869	1,391	6,531	6,856	109	554	7,519
1941	745	380	31	1,529	0	752	323	3,760	4,088	138	553	93	784	4,872	1,021	234	6,127	6,844	157	573	7,574
1942	1,179	339	37	2,424	17	57	37	4,090	4,119	133	715	30	878	4,997	1,250	39	6,286	7,044	179	724	7,947
1943	1,459	120	0	1,920	76	27	4	3,606	3,804	269	544	183	996	4,800	1,134	25	5,959	7,833	108[a]	837[b]	(8,778)
1944	1,911	329	5	595	14	0	0	2,854	2,564	245	306	112	663	3,227	1,012	74	4,313	5,849	93[a]	437[b]	(6,379)

Note: Spaces left blank indicate no data available at present.

STEEL DRUM Reconditioning

... performed on specially-designed equipment

Fig. 1 — Conveyor-infrared oven combination makes the entire painting and drying job almost 100 per cent automatic

By WILLIAM J. MISKELLA
Miskella Infra-Red Co.
Cleveland

RECONDITIONING steel drums is a business which requires specially-designed equipment and carefully planned procedures. Practice in the plant of L. Gottlieb, Cleveland, in renewing drums is developed to a high degree of efficiency, and involves several interesting cleaning, painting and inspection operations.

An inclined skid feeds old drums directly into a washer where hot alkali cleaners under pressure spray the exterior of the old drums from all directions to soften up the old paint and dirt. Before coming out of this washer at the opposite end, drums are scrubbed by large rotary brushes. Also a hot rinsing operation is performed. Drums are placed on a roller conveyor long enough to hold ten drums head down over protruding vertical nozzles.

Powerful sprays of the hot alkali cleaner are simultaneously directed upward into the interior of the ten drums. Afterwards the drums are systematically lifted off the protruding nozzles, placed on another run of roller conveyor so that the cleaning liquid may be drained out and into the trough in the concrete floor. This waste flows back to the exterior washer which pumps it up and into a recirculating system to be used over and over again.

Next the ten drums are set on another run of roller conveyor on the floor at the end of which they are taken off, slightly tilted and a long nozzle attached to a hose inserted so that the end of each nozzle rests in the "corner" of the interior of the drum. Ten of these nozzles pump out the water with electric power furnished by the large direct motor-driven pump at the right. This is known as a syphon dryer.

"Chaining" Machine—The drums are then passed on another roller conveyor to the inspection station where a tubular electric lamp on the end of a long rod and controlled by a counterbalance enables the inspector to reject those drums which may not come up to standard. Occasionally the inspector catches a drum which should have been directed initially to the motor-driven "chaining" machine. This is a special device, deriving its name from the fact that pieces of log chain are fed into the interior through the bunghole to serve as a medium for loosening heavy residue such as caked paint or other materials which were left in the drum by the previous owner.

This machine has several mechanical motions designed to present the interior surfaces for proper action by the chains or other tumbling media. The rocking motion tilts the five drums in the machine simultaneously from one end to the other so the solvent liquid will swish back and forth continuously. At the same time, a pair of rollers on the bottom causes the drums to rotate slowly. Operations done by the machine are usually performed before the drums enter the washer. Finally, the cleaning solvent

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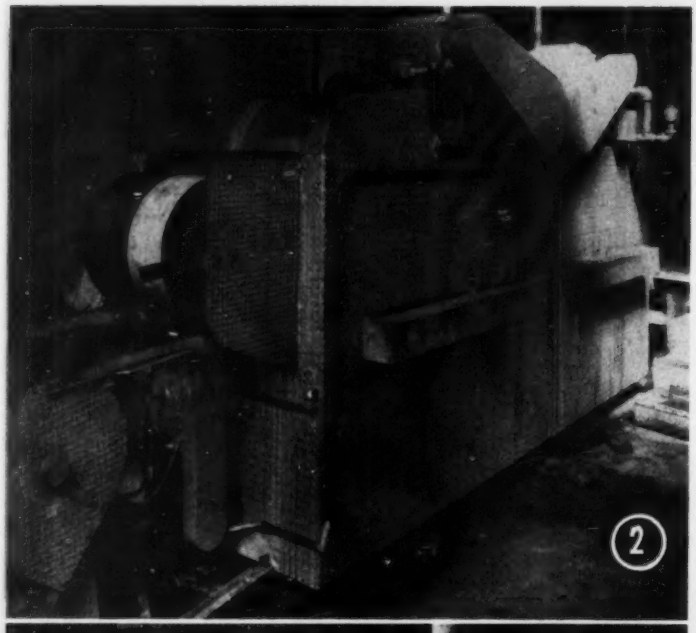

Fig. 2—Drum washer where hot alkali cleaners under pressure spray the exterior of old drums from all directions to soften up old paint and dirt

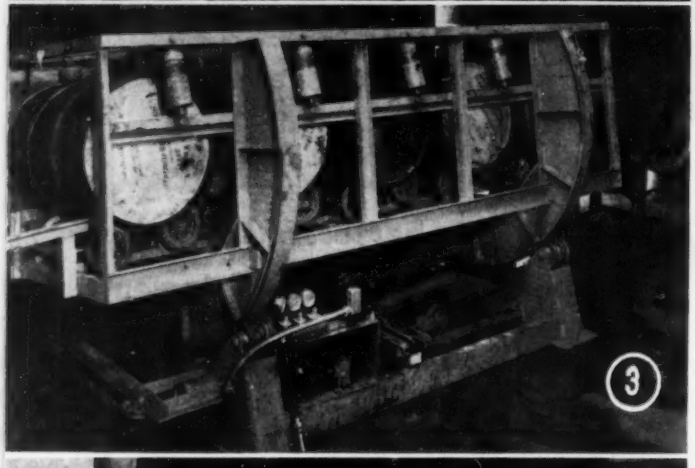

Fig. 3 — "Chaining" machine used for loosening heavy residue such as caked paint or other materials left in the drum. This machine has several mechanical motions designed to present the interior surfaces for proper action by log chains or other tumbling media

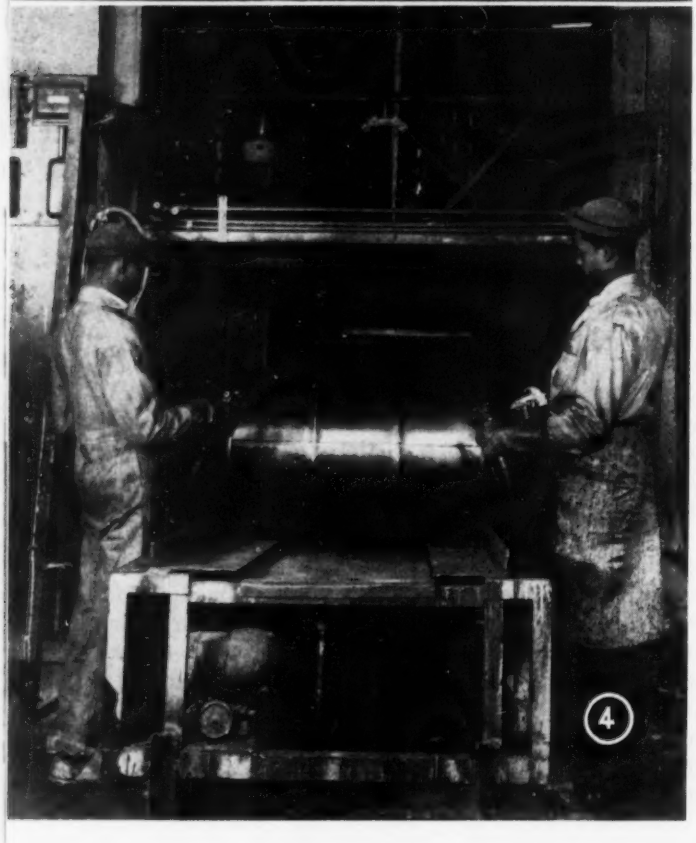

Fig. 4—Automatic pressurized spray painting machine consists of a battery of automatic spray guns, each set to do a certain portion of the painting job. An electric revolving device whirls drums in front of the guns

is drained out and these especially-treated drums are ready to pass through the regular cleaning routine starting with the exterior washer.

After the inspector has passed the drums, which have been thoroughly cleaned both inside and outside, they are rolled into another machine. This so-called "chime sealer" has every mechanical feature needed to roll the chimes or heads of the drums thoroughly to take out dents, close openings, etc. A pair of heavy steel head plates which fit into the chimes, grips the drum firmly. A pushbutton switch controls this gripping. Another pushbutton starts the rotation actuated by the powerful 15 hp motor that is nearly as big as the drum. The complete electric control box is located just above the motor. Another button sets the automatic release so that the drums, as they are continuously processing in this chime sealer, may roll down the skid and into position for entrance to the spray booth in which the paint may be either automatically or hand applied.

Pressurized Spray Painting—The automatic pressurized spray painting machine consists of a battery of automatic spray guns, each set to do a certain portion of the painting job, in any color combination required. An electric revolving device whirls the drums in front of these spray guns. In much less than 1 minute the painted drums are kicked out of the painting machine, rolled down a slight incline where "ice-tong" grippers, automatically engage the drums and carry them on the conveyor to the entrance of the special Miskella infrared oven.

When it is not practical to use the automatic spray equipment, two sprayers, each with a spray gun in each hand (four guns in all) simultaneouly paint the heads and body of the mechanically revolving drums with two colors. On the opposite side of the spray-booth the automatic pickup grippers go into action. The moving, but empty grippers simply slide along on a pair of rod guides. This spreads them sufficiently to admit the painted drum as the hooks fall into place. No labor, no trouble—they just keep on "gripping" all day long. This method of gripping has developed through the co-operation of the superintendent of the drum reconditioning plant and The Joel Co., conveyor specialists. It permits the use of angularly-directed heat on top and bottom as well as on the ends, while drums are in the oven.

Some rough sketches were given to the conveyor company and eventually the "ice-tong" idea demon-

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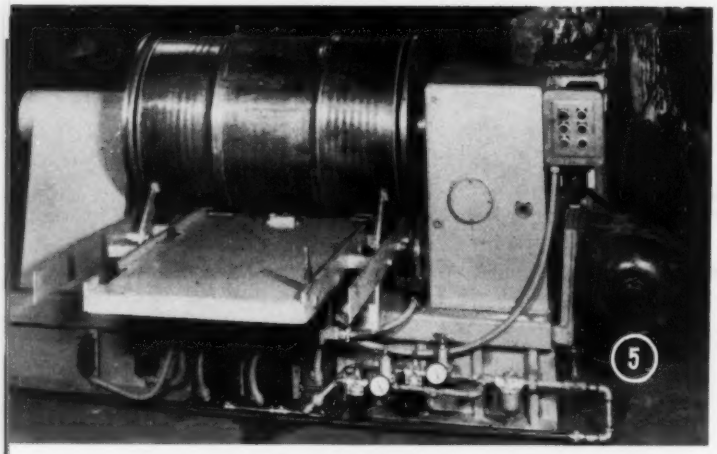

Fig. 5—This chime sealer rolls chimes or heads of drums to take out dents, close openings

strated its value. The trolley type overhead conveyor used in this infrared oven is ideal and much lower in cost than the types previously used. The oven has a much lower operating cost, greater output, yet less in price than any heretofore offered in this field. Due to the close competition in the drum manufacturing business even a fraction of a cent extra in cost is important.

Infrared Drying—Not only are the drums successfully baked in the combined infrared oven and conveyor setup, but the entire job became almost 100 per cent automatic, even to the actual carrying of the drums (still on the conveyor) to the truck at the shipping room door, without any handling whatever. The truck driver now lifts the drums "down" off the conveyor in order to load them on his truck. The old practice was to store the air-dried drums on the floor of the shipping department where they had to be "lifted up" to be placed on the motor truck that is used to convey them to the customer.

Angularly directed heat is instantly applied to all surfaces for 4 minutes. The drums, riding on 36-inch centers, emerge from the out end of the infrared oven. The drums do not revolve in the oven. They are too hot to handle so the 10-minute travel time from the oven to the shipping department (on an extended conveyor) nicely settles this minor point.

The new Miskella oven has a connected load of 162 kw and processes 90 heavy, returnable 55-gallon drums per hour at a temperature of 250° F. The entire bottom of the 24½ foot oven consists of hinged sections which drop down to enable the maintenance men to get in easily for servicing. An expanded metal screen serves as a safety guard for the lamps in case a drum should accidently drop in the oven. Eighteen control switches are used to vary the oven heat and a master control near the end of the oven serves to connect or disconnect the entire oven as well as the two ceiling blowers.

New Books

Metallurgy and Magnetism, by Dr. James K. Stanley, research metallurgist, Westinghouse Electric Corp., 150 pages, published by American Society for Metals, Cleveland, for $4.00.

Book consists of four profusely illustrated chapters, headings of which are: Magnetic theory and definitions, types of magnetic materials—soft magnetic materials and permanent magnets, factors affecting magnetic properties—product factors and chemical and structural factors, magnetic analysis—a metallurgical tool. It is thought that the book represents the first attempt to treat systematically in one volume the factors affecting magnetic quality. Chapter IV tells plant metallurgists and research workers how changes in various magnetic properties can be used to study metallurgical and solid-state problems. The book can be used as an introductory text on ferro magnetism and types of magnetic materials.

—o—

Hardfacing by Welding, by M. Riddihough; cloth, 127 pages, 5½ x 8¾ inches; published by Louis Cassier Co., Ltd., London.

The book, devoted solely to the subject of hardfacing, presents information which will enable the welding and maintenance engineer to perform the job of hardfacing every type of metal. It covers the various stages of the process—design of component, choice of hardfacing alloy and technique of depositing, inspection and finishing methods.

Hardfacing is the art of welding an economical amount of the most wear-resistant alloy to the position where it is most needed. The process allows cheaper metals to be used for the body of the job. Included in the English book are 81 photographs and diagrams, 24 tables for reference and an appendix containing details of both English and American hardfacing materials. Among the subjects covered are hardfacing rods and their development, preheating and cooling, heat treatment for hardfacing various types of metals, equipment and jigs, inspecting, machining and grinding the deposit, and estimating and planning.

—o—

Album of Historical Steam Traction Engines and Threshing Equipment—No. 1, by Floyd Clymer; 160 pages, 8½ x 11-inches; published by Floyd Clymer; Los Angeles, for $2.50 (paper edition) and $3.50 (fabrikoid edition).

United States and foreign makes of steam traction engines and threshing equipment made in the period from 1855 to 1929 are shown in this book, first of a series to be published by Floyd Clymer. Although traction engines were an important stable and useful phase of American agricultural life from about 1880 to 1923, the period during which these engines were in use in Europe was even longer. The traction engine growth was rapid in the United States and between the covers of this book, the reader will find such names as Case, Avery, Rumely, Advance and Westinghouse.

The book is unique in that it presents a series of advertisements of this type of equipment which appeared in publications of that time. A considerable number of what appear to be catalog photographs appear along with engineering drawings detailing operation of the equipment. As the author states in his foreword, "like the cylinder gramaphone, the interurban trolley car and the 'surrey with the fringe on top,' steam traction engines have passed into that limbo of useful American gadgets which helped the country grow and develop. Unfortunately, sentiment cannot hold back the wheels of progress." The book is a collectors item.

Also available from the publisher is a series of five historical motor scrapbooks, containing pictures and detailed information on many of the earlier makes of automobiles. Some 200 ancient and modern steam autos are pictured in volume I of the steam car edition, also available.

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Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Smith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
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MAKING STEEL from Argentine High-Phos Pig Iron

By E. J. ASH
Consulting Engineer
Buenos Aires
Argentina

Experimental heats made at an Ohio electric furnace shop using an all-pig charge demonstrates the feasibility of the practice on a commercial scale in that country. Charging and melting procedures and physical analysis of end product are presented

APPROXIMATELY 14 major iron ore deposits are to be found in that portion of the Andes Mountains lying within the border limits of Argentina. Near the town of Zapla, Province of Jujuy, one of these ore deposits is being exploited by the Argentine Army. Here is located a charcoal blast furnace, producing from 60 to 80 tons of pig iron daily. This blast furnace, the only one in Argentina, has been in operation approximately four years. Because of the type of fuel used, the sulphur content of the pig produced is 0.01 per cent but the phosphorus content varies from 1.10 to 1.20 per cent. The output from this furnace is consumed by various gray iron foundries.

A rough calculation of steel melted in Argentina indicates that about 400 tons of steel scrap is remelted daily in open-hearth furnaces, cast into ingots approximately 6 x 6 inches square by 54 inches long, and subsequently converted into shapes, the major portion of which is rolled into rounds for concrete reinforcing. In addition to this consumption of steel scrap for melting there are about 25 steel foundries using another 50 to 100 tons of scrap daily. A number of gray iron foundries use steel scrap in their cupola charges. The total amount of steel scrap melted daily is estimated to vary between 500 and 600 tons.

Argentina has never produced any steel from its nationally-produced pig iron. Therefore, all the steel scrap being remelted has been imported, either as scrap, or as scrap that has accumulated from various types of equipment purchased abroad, such as railroad stocks, agricultural machinery, etc. At present, however, due to the dollar shortage, the problem of securing steel scrap is becoming serious. It is obvious that someday in the near future the supply of accumulated steel scrap will be exhausted. The diminishing supply of scrap is already being experienced by melting shops. One producer has offered to sell cast ingots for rolling only in exchange for an equivalent value of steel melting scrap. Some steel scrap is being imported from the war areas, especially Italy, Northern Africa and the Philippines.

The Argentine government, therefore, is interested in making steel from its own nationally produced pig iron, not only to arrest the rapidly dwindling stock of scrap, but also for strategical reasons. Argentina has the iron ore deposits and also the necessary limestone and fuel for pig iron production, but to date, not a single ton of this pig iron has been refined into steel, chiefly because of its high phosphorus content.

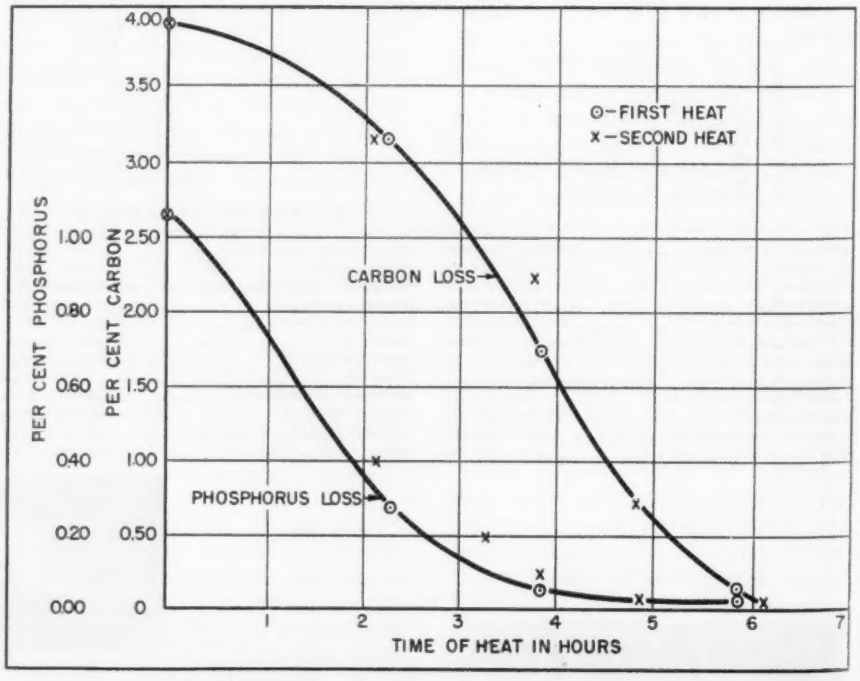
For the purpose of demonstrating that a quality steel can be made from this high phosphorus pig iron, 3 tons of iron were shipped from the Zapla blast furnace to the Timken Roller Bearing Co., Canton, O. Two experimental heats, using 100 per cent high phosphorus pig iron from Argentina as the charge, were finished into steel, using a 1-ton basic-lined electric furnace.

A condensed log of typical furnace operations for the two heats is given in Table I.

The charge for this heat consisted of 2194 pounds of Argentine high phosphorus pig iron containing 1.09 per cent phosphorus. Table II indicates the theoretical amount of Fe_2O_3 required to oxidize the carbon, manganese, silicon and phosphorus in this charge. The theoretical amount of lime required in this charge is shown in Table III.

As seen from the log in Table I, in the process of making this heat 400 pounds of lime was actually added. The theoretical amount of lime does not take into consideration the lime needed for fluxing, the gangue of the ore used, the SiO_2 in the lime, refractory erosion and the excess of lime normally required.

The total weight of mill scale and iron ore added to the charge was



Rate of carbon and phosphorus loss during working of heats

300 and 395 pounds respectively. This total does not include the amount of oxygen added to the bath during the 11 minutes of blowing. A ½-inch pipe and oxygen under 90 pounds pressure were used for blowing.

The ratio of total oxide to the metal charged (not including the oxygen blown into the bath) was 1 to 3.2, and that of lime to the total charge was 1 to 5.5.

The accompanying graph indicates the rate of carbon and phosphorus removal for the two heats made. Physical properties of the steel, ¾-inch bar as rolled, are presented in Table IV.

It should be pointed out that these heats were of an experimental nature and are of interest not only because they represent electric furnace operations when using a charge of 100 per cent high phosphorus pig iron, but also because this is the first steel made from Argentine pig iron.

TABLE I

CONDENSED LOG OF FURNACE OPERATIONS IN REFINING A 100 PER CENT HIGH-PHOS PIG IRON CHARGE IN AN ELECTRIC FURNACE

Material charged:	2194 lbs. of high-phos pig iron from Argentina
Composition:	C—3.85 Mn—0.85 Si—1.22 P—1.09 S—0.015
8:22	Power on
8:22 to 10:37	Added 150 lbs. lime 200 lbs. mill scale 140 lbs. iron ore
10:37	Metal test—C—3.19 P—0.26 S—0.013
10:37 to 12:10	Added 50 lbs. lime 75 lbs. mill scale 150 lbs. iron ore 4 minutes of oxygen
12:10	Metal test .....C—1.95 P—0.052 S—0.013
12:10 to 2:11	Added 150 lbs. lime 25 lbs. mill scale 105 lbs. iron ore 7 minutes of oxygen
2:11	Metal test .....C—0.14 P—0.021 S—0.013
2:11 to 3:15	Added 6 lbs. coal 110 lbs. lime 15 lbs. spar 10 lbs. sand 14 lbs. coke 14¼ lbs. FeSi 18½ lbs. FeMn 1½ lbs. Al
Final composition:	C—0.33 Mn—0.74 Si—0.20 P—0.03 S—0.010
Total additions:	Lime 400 lbs. Scale 300 lbs. Ore 395 lbs.

TABLE II

CONSTITUENTS OF HEAT

Element	% in Charge	Pounds in charge	Fe_2O_3 required per pound of element, lbs.	Total amount of Fe_2O_3 required, lbs.
Carbon	3.85	84.46	4.44	375
Manganese	0.85	18.65	1.00	18
Silicon	1.22	26.77	5.05	135
Phosphorus	1.09	23.91	4.30	102
				630

TABLE III

AMOUNT OF LIME REQUIRED IN CHARGE

Element	% of Charge	Pounds in charge	CaO required per pound of element, lbs.	Total amount of CaO required, lbs.
Silicon	1.22	26.77	5.00	135
Phosphorus	1.09	23.91	2.71	66
				201

TABLE IV

PHYSICAL PROPERTIES OF STEEL MADE FROM ARGENTINE PIG IRON

Type steel	Yield point, lbs	Ultimate tensile strength, lbs	Elongation %	Reduction of area, %	Brinell hardness No.
1030	65,000	96,875	25	48.2	179
4620	81,000	97,125	24	67.4	192

Studies Acid, Abrasion Resistance of Enamels

Acetic acid, which produces only minor visible attack in acid pretreatment of porcelain enamels, has been found to strongly inhibit further attack when subsequently treated with citric acid, although the citric acid severely attacked the untreated areas of the same enameled specimens. In tests conducted at the Enameled Metals Laboratory of the National Bureau of Standards, Washington, by W. N. Harrison, J. C. Richmond and J. R. Crandall, it was found that pretreatment with acetic acid in concentrations from 0.5 to 50 per cent for periods of 5 minutes or longer was effective against subsequent treatment with 10 per cent citric acid. Treatment with butyric acid for 15 minutes produced the same effect, but neither tartaric nor lactic acid was effective it was reported.

In the revision of the Federal specification for enameled graduates for darkroom use, tests were made to compare the relative effects of hydrochloric, acetic and citric acids on a number of enamels. These tests indicated that acetic acid was much less corrosive than were hydrochloric and citric acids. The passivation effect noted above is explained on the hypothesis that the acetic and butyric acids preferentially leach alkalies from the enamel surface, leaving behind a silica-rich film which is resistant to further solution, even in citric or stronger acids. With citric acid, the attack apparently proceeds to a greater depth before sufficient thickness of this film is built up to inhibit further solution.

The laboratory found that treatment for 15 minutes in 10 per cent citric acid appreciably reduced the abrasion resistance of certain enamels having Class B or Class A acid resistance (Porcelain Enamel Institute standard test), this effect being more pronounced on titanium-type enamels than on antimony-type enamels. Abrasion resistance of Class AA enamels was in no case effected.

The effect of abrasion such as would occur, for instance, when a stained spot on an enameled article was scoured, was sufficient to reduce the rating on some enamels from a good Class B by the standard test to a poor Class C by the same test modified to include the abrasion treatment. It was reported that the same amount of abrasion had no appreciable effect on the untreated areas of the specimens.

While full explanations of the phenomena noted are yet to be determined, it is believed that these two effects are related, and that the two silica-rich layers resulting from preferential solution of the alkali is less resistant to abrasion than the original surface, although more resistant to acid attack. The results, as determined by the Enameled Metals Laboratory, suggest that the titanium-type enamels are especially sensitive to the observed effects, and that routine inspection tests should be made in regular production to assure that the composition and processing of the enamels are maintained at optimum conditions. The increased use of titanium-type enamels and the sensitivity of these enamels to attack by abrasion after treatment with acid indicate that an abrasion treatment should be incorporated in the standard test for acid resistance.

—o—

An addition of four skids, with minimum dimensions, as recommended by the standing committee of the industry, are contained in the revision of simplified practice recommendation R95-30, skid platforms, being submitted to producers, distributors users and others interested for acception or comment. Copies may be obtained from Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

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Pressure Loss Reduced in New Steel Valve Body

Reducing pressure loss by a reported 40 per cent and making possible use of smaller pipe and valves, a newly designed cast steel valve body is also said to reduce weight and wear-producing turbulence. Developed through laboratory research by Edward Valves Inc., East Chicago, Ind., the valve's smaller size has been achieved by use of an integral Stellite seat and an equalizer which allows the disk-piston to rise completely out of the path of flow, thus utilizing the entire flow passage.

Bonnet bore, only slightly larger than the ASA standard for port openings, results in reduction of weight and minimized pressure load on bonnet seal and operating mechanism. The equalization of pressure in all internal areas, reduced disk-piston weight and streamlined internal contours which eliminate the wear-producing turbulence, are said to combine to decrease pressure loss. Valves in the new body design are built in 900, 1500 and 2500 pound classes with both globe and angle patterns.

High Amp Connections Silver Plated by Powder

High amperage electrical connections may be silver plated on the job with only a sharp steel wire brush or abrasive cloth, a clean rag and water being necessary to perform the operation. A layer of silver which will not peel off and which gives cool maximum conductivity for copper, brass or bronze contacts is applied by alternately dipping a slightly damp cloth pad into a silver plating powder and rubbing on the surface to be treated.

Eliminating the problem of heating due to oxidation, the new product is also said to present losses too small to create noticeable heat, but still accumulating into major power losses. Made by Cool-Amp Co. of Portland, Oreg. the silver plating powder is harmless to the user. It is available in 1-pound jars.

Roller Chain Repair Set

To facilitate repair of American standard roller chain, Atlas Chain & Mfg. Co., Philadelphia, has developed a new tool which prevents binding in the driving out of the pins. Consisting of an anvil, fork and a punch, the tool suspends the chain on the fork, allowing the pins to be removed by striking alternately each of the two pins held. It is available in sizes to fit any standard roller chain.

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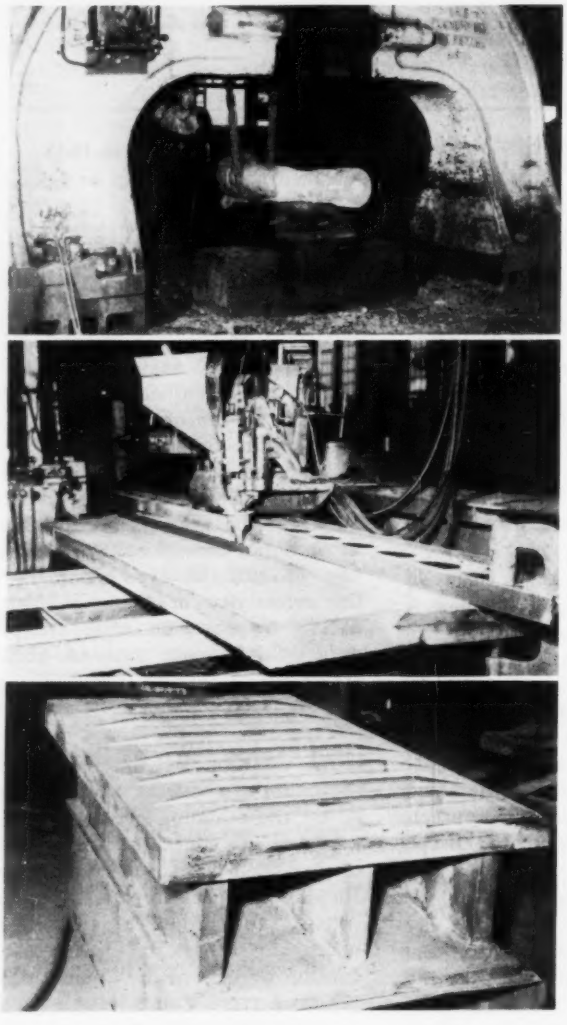
Accurate and instant answers in the addition and subtraction of fractions and decimals and their conversion either way may be obtained from the Neighbors rule, offered by United Tool Service Corp., Chicago 24, Ill., for $1.



3 Operations

. . . produce forming dies from locomotive axles

EFFECTIVE use of three operations—forging, flame-cutting and automatic submerged welding—enables the Omaha shops of the Union Pacific Railroad to convert scrap locomotive axles into large press dies for forming car parts. Procedure is to flatten the axles by means of a forging hammer, trim them and prepare V-edges by flame-cutting. In succeeding operations a sufficient number of prepared billets are welded together for the particular die being made and the detailed forming parts for both male and female halves are welded on.

A scrap axle that has been heated to about 2300° is about to be flattened to the desired thickness by a drop hammer in top photo. After flattening operation, the rough billets go to the flame-cutting operation where they are cut to specified size. Billet edges that are to be welded are prepared with the double V shown in center photo. Unionmelt welding process used, installed by Oxweld Railroad Service Co., Chicago, calls for ¼-inch rod and proceeds at about 14 inches per minute. Using from 800 to 1100 amp alternating current, the required number of passes are made on each side of this 3½-inch thick billet. Formed weldments of this type have been made up to 100 inches long, 3½ inches thick and 50 inches wide, the railroad states.

Male half of a nearly completed car-part forming die is illustrated in bottom photo. Using method outlined, billets have been made from locomotive axles to make dies for corrugated ends for coal cars, corrugated dump doors, car side posts, spring planks, front and back flue sheets and many types of face plates.

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REASONS WHY HYSTER "20" MOVES MORE MATERIALS...

- ✔ Pneumatic tires.
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- ✔ Load-Grab — For handling many loads without pallets.
- ✔ Special Load-Grab arms available for handling bales, boxes, bundles, bags, barrels, oil drums — without pallets.

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FUNDAMENTALS of STEELMAKING

NUMBER 10 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

PRODUCTION OF TIN PLATE

Within the last four years, new equipment has been developed which permits electrolytic white pickling just ahead of the tin pot, thereby making the operation an integral part of the hot dip tinning process. Heavy manual labor involved in batch or pack type pickling and in feeding tinning machines is thus eliminated with this improved set up

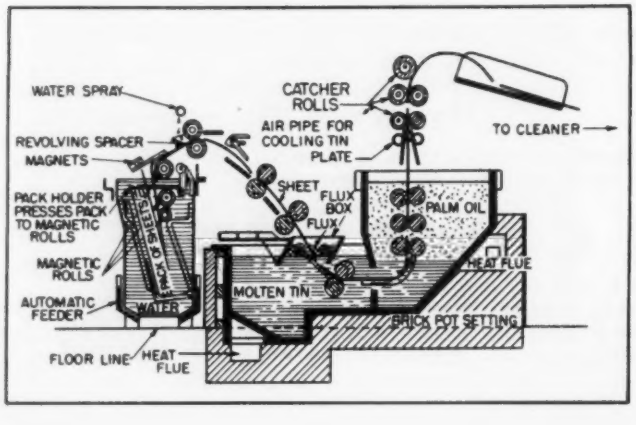
By ALFRED E. KADELL

Manager, Tin Plate Dept.
Weirton Steel Co.
Weirton, W. Va.

PART II

PREVIOUS to World War II, the universal method of applying a tin coating, in the manufacture of tin plate, was by the hot-dip process. That is, steel cut into sheet form, was put through a bath of molten tin. The common coating weight was 1½ pounds of tin per base box. Tin plate is produced and sold on a sheet area equivalent basis, and theoretical unit of sale is the base box which consists of 112 sheets, each 14 x 20 inches. This amounts to a total sheet area of 31,360 square inches in the unit. Gage, or thickness, of the sheets therefore determines base box weight, which is referred to by the industry as basis weight. Common basis weights employed are 75, 80, 85, 90, 95, 100, and 107 pounds. Thus, if a tin plate consumer orders 90 pounds basis weight plate from the mill, he also specifies lineal dimensions he desires the sheets to have. The mill then rolls the steel to the thickness and sheet weight required so that any 31,360 square inches of sheet area in this order will weigh 90 pounds plus or minus established commercial tolerances. The 1½ pounds of tin mentioned above therefore cover both sides of 31,360 square inches of plate. In coating thickness this is equivalent to about 0.00008-inch on each side of the sheet.

Fig. 6—Schematic diagram of a typical tin pot and tinning machine



With the advent of World War II, the Japanese seized British and Dutch tin producing possessions in the far east, thereby producing a shortage in the United States which was at the time wholly dependent on those sources of supply. The urgent necessity for conserving tin brought into rapid use the electrolytic tin coating process whereby coatings as low as ¼ pound per base box could be applied successfully. At the present writing, almost half the tin plate produced in the United States is coated by this method.

After temper rolling, therefore, coils will go to either of two different processes, depending on which type of tin plate the purchaser specifies.

The hot dip method requires that steel be processed in sheet form. The temper-rolled coil is, therefore, sent to a cutting line where it is side trimmed and cross cut into sheets to dimensions specified on the order.

The coil is then placed in a conventional type motor driven uncoiler, which is not used, in this operation, to generate any back pull, because the band must be processed without tension being applied to it. As it is unwound, the band makes a shallow loop before entering a motor-driven side trimmer where approximately ⅜-inch is slit off each side. Width of the strip now becomes one dimension of the ordered plate size. This is accomplished by two sets of 12-inch diameter rotary knives in the side trimmer, which are set to the desired distance apart on their shafts by the unit's operator. Upon leaving the side trimmer, the band forms another shallow loop, and then passes through a hole detector and a gaging device. As tin plate is very light in gage, it is possible, under certain conditions, for preceding operations, particularly tandem cold reduction, to create small holes in the steel, hence hole detectors are used on the cutting lines.

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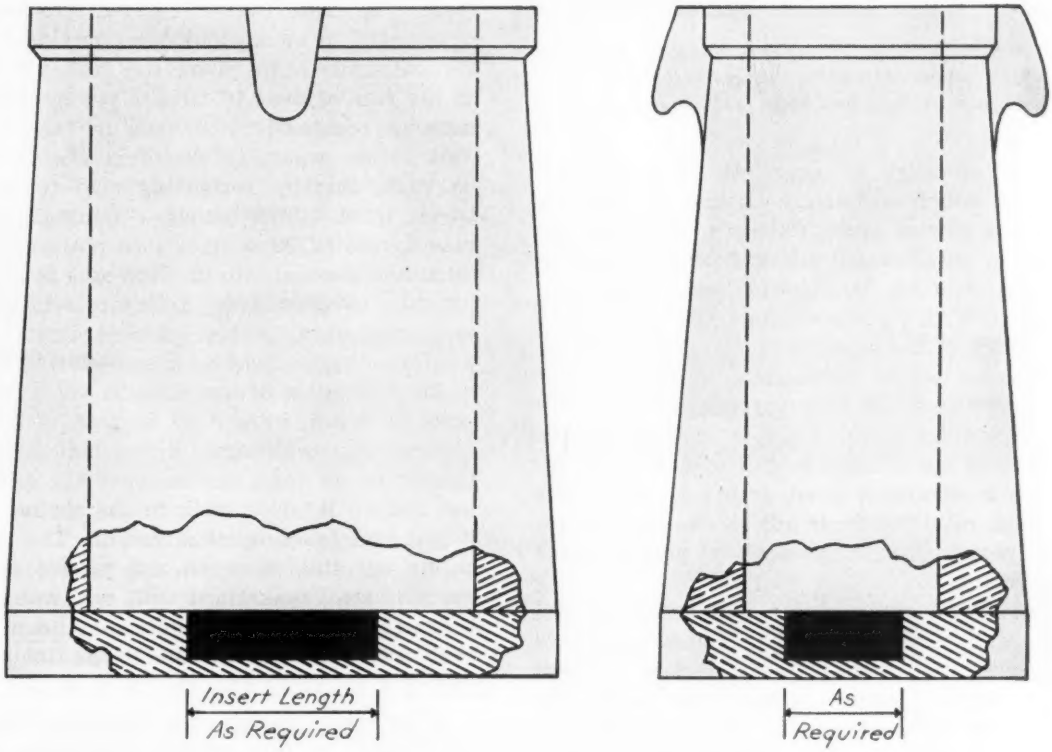

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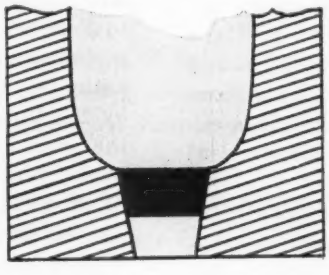

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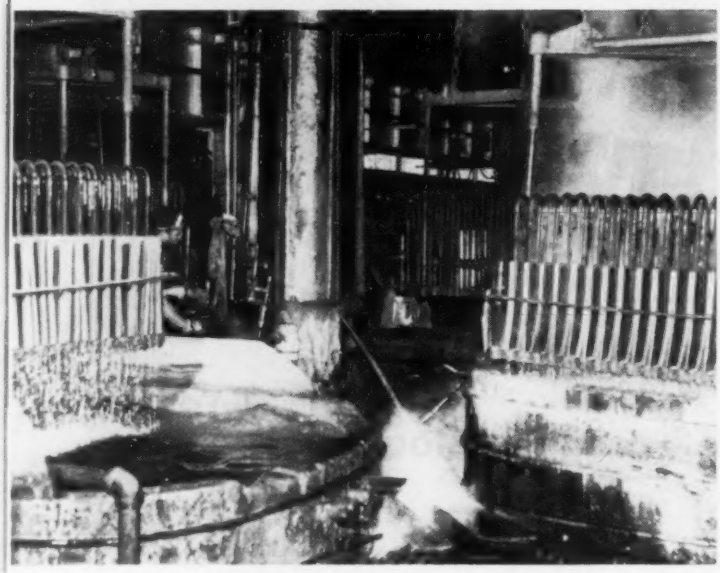

Fig. 7—White pickling operation, showing crates loaded with packs of sheets being raised out of acid tank at right and rinse tank at left

After passing through a gager, the band enters a roller leveller which completely flattens it. Leaving the leveller, a pair of pinch rolls grip the band and feed it into a shear which consists of two rotating drums, about 9 inches in diameter, each containing a shear knife. With every revolution, the knives meet at the pass line of the band and make a cut. Length of the cut is set up on the machine by the operator on a scale provided for that purpose. This setting brings into play the proper gears in the shear's gear box for making the desired length of cut. A P.I.V. control aids in obtaining great accuracy. The roller leveller, pinch rolls and shear are so closely synchronized as to permit shearing accuracy of plus or minus 1/32 of an inch.

Upon leaving the shear, sheets, now cut to ordered dimensions, fall on a belt conveyor which transports them to a piling box where they are stacked in a neat pile to a height of about 40 inches. The line is then stopped and the lift removed by crane or truck.

The hole detector is a light source operating on the same principle as a photo cell. The gaging device measures thickness of the band passing through it. When a hole in the strip passes through the hole detector, or when the micrometer gaging device detects off-gage plate, a gate or flap, located in the conveyor about 8 feet past the shear, opens and deflects these off-grade sheets on to a lower conveyor which carries them to a piling box. This defective plate is then sent to a salvaging department which recovers the salable portion.

At this stage of the process, sheets are known as full finished black plate, and a considerable amount of it is consumed in that state for fabrication into articles requiring no tin coating.

Piles of sheared steel sheets are now taken to a pickler where any surface oxides are removed in a dilute solution of about 6 per cent sulphuric acid maintained at a temperature of about 180° F. Good tinning practice demands that the surface to be tin coated be perfectly clean and free of all oxides. A white pickling machine, which performs this operation, is powered by a steam engine, to the piston of which is attached a hollow cylindrical steel piston rod about 12 inches in outside diameter, wall thickness of ¾ of an inch, and 10 feet long. The entire machine stands upright, the piston stroke therefore being vertical. To the very top of the piston rod, which rises to a point about 15 feet from the ground at the height of the piston's stroke, four equidistant arms are attached, and from each arm there hangs, from chains, a crate made of acid resistant metal. Each crate, about 5 x 5 foot at the base and 5 feet high, is subdivided into a number of narrow compartments into each of which a pack of sheets weighing about 150 pounds is placed standing on edge. When the crate is fully loaded, the piston rod is raised thereby lifting the crate, now holding from 2500 to 3000 pounds of sheets, and rotated into position directly over the sulphuric acid tank. The crate is now lowered into the tank, and is agitated in an up and down motion by the short vertical stroke of the piston rod, from which it is hung, at the rate of over 40 strokes per minute, sheets remaining constantly immersed in the acid solution. This action separates sheets in the packs standing on edge, thereby permitting acid to penetrate between them. After about 3 minutes, the crate is raised, rotated 90 degrees into position over a rinse tank, and lowered into it. This tank is kept overflowing by a constant heavy inflow of cold water. In the same motion, a freshly loaded crate is rotated into position over the acid tank, and lowered into it. After about 3 minutes of agitation in the rinse tank, the crate is raised, rotated 90 degrees, and set down on a supporting table about 3 feet high, where the continuing up an down movement of the piston rod does not disturb it, since slack in the chains, from which it is hung, takes up this motion. The packs of wet sheets are then removed and packed on edge in a portable steel tank filled with cold water which prevents rapid rusting. The tank, called a water bosh, is then transported by crane to the tinhouse for coating.

A tin house consists of a number of tinning stacks, the largest in this country containing 55 of them. A tinning stack comprises the tin pot with its feeding and tinning machines, a water cleaner which is a steel tank containing a hot dilute solution of alkali, and a branner which utilizes rye or wheat middlings to clean and polish the tin plate. Fig. 6 shows a cross-sectional view of the tin pot, its equipment, and the automatic feeder. The tinning machine is represented by the three pairs of rolls in vertical arrangement in the palm oil compartment at the right. The Davis feeder is represented by the three pairs of rolls aligned in an angular plane in the left side of the tin pot. The automatic feeder is shown immediately to the left of the tin pot. The operator withdraws handfuls of plate from the water bosh, which had been transferred from the pickler to the stack by crane, and stands them on edge in the water filled tank of the automatic feeder. The plate is brought by the operator up to the fluted magnet roll which, in rotating, pulls the sheets up and out of the tank individually.

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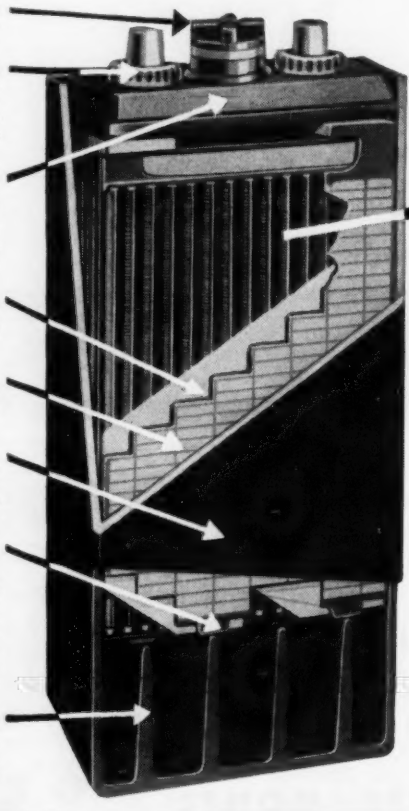
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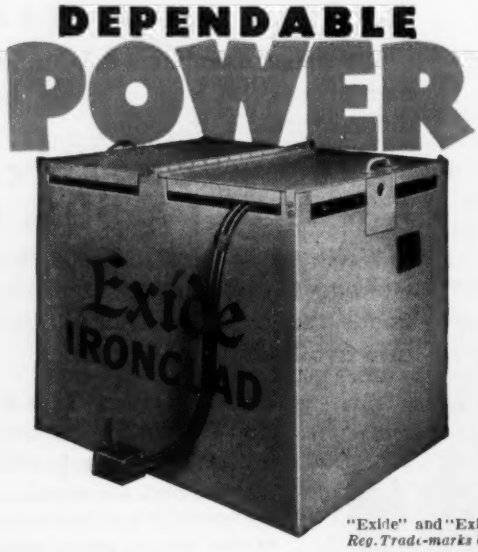

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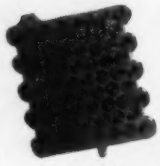

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A film of water between sheets makes them slide readily over each other. The second rotating magnet roll then picks the sheet up as it emerges from the tank and transports it to another pair of rolls which, with the aid of guides, then directs it downward into the top rolls of the Davis feeder. It continues down to the second pair of rolls, and, thence through a zinc chloride flux into the molten tin and then through the bottom rolls. The apron then guides the sheets up into the tin machine which is completely immersed in palm oil.

The purpose of fluxing the sheet, before it moves into the molten tin bath, is to further cleanse the surfaces, in order that tin will adhere to them completely and thoroughly so as to leave no exposed steel areas. The palm oil prevents oxidation of the tin coating on the sheet during the tinning operation, thereby producing a high lustre, and aids the tin machine in properly controlling weight and distribution of the coating.

As the coated sheet emerges from the tin machine, it is cooled from both sides with an air blast to quickly solidify the molten tin. It then enters catcher rolls which deposit it on a conveyor that transports it to a water cleaner where the alkali removes a considerable portion of the excess palm oil. Upon emerging from the water cleaner the sheet enters a branner which removes all but a trace of the remaining palm oil, and also polishes both surfaces. The branner consists of a series of pairs of alternately fast and slow rolls made up of cloth disks mounted, under pressure, on a steel shaft and turned down on a lathe to produce a smooth surface. Between the first two sets of cloth rolls, rye or wheat middlings are distributed across by means of a screw feed. The slow rolls carry the tin plate sheets through the branner, while the fast rolls, with the aid of the middlings, clean and polish both surfaces. At a given point ahead of the last few pair of rolls, middlings drop down into a hopper, whence they are returned to the branner for re-use. Upon emerging from the branner, sheets drop into a piling box with adjustable sides which permit it to be arranged to take any commercial tin plate size. When the pile has attained a height of about 20 inches it is removed by crane or lift truck, and sent to the assorting department for individual sheet inspection.

In the tin pot, heat, generally gas, is applied under both tin and palm oil baths. (See Fig. 6) The tin bath is maintained at a temperature slightly over 600° F, while palm oil is held around 465° F. The length of the tin pot being about 8 feet, in the case of large size plate, two sheets are fed through the pot side by side. In the case of narrow plate, three sheets are fed in a similar manner. One operator or tinner, as he is called, operates two stacks equipped with automatic feed. Hand-fed stacks are also in use. Only difference between this type of stack and the automatic feed type, is the absence of the automatic feeder and the presence of a magnet roll just ahead of the Davis feeder. On this kind of tin stack, the tinner feeds sheets singly, by hand, up to the magnet roll which carries them on into the Davis feeder.

Although present day tin stacks operate at a much higher rate of speed than they did a number of years ago, the entire operation as compared with cleaning, temper rolling and even cutting is very slow. About 35 feet per minute is the common rate of operation.

Within the past four years, equipment has been developed which permits white pickling by electrolytic means just ahead of the tin pot, thereby making the operation an integral part of the hot dip tinning process. Heavy manual labor involved in the batch or pack type pickling described previously, and in feeding the tinning machine, are eliminated by this equipment. A number of such installations are now in operation throughout the industry. An electrolytic white pickling line consists of an automatic feeder, generally of the vacuum cup type, followed by a rubber-lined electrolytic pickling tank which contains two conductor roll assemblies spaced about 18 inches apart. Each conductor roll assembly consists of a stainless steel top roll in contact with a rubber-covered bottom roll, both top rolls being connected to one side of the generator. Between the two conductor roll assemblies, are located the upper and

Fig. 8—View of tinning stack showing water bosh at right with tin pot and automatic feeder directly behind it. Branner and piling box at left

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Fig. 9—Reckoner counting tin plate. Scale in background is used to check weights of individual packages

lower anodes, which are metallic, and are spaced about 3 inches apart. These anodes are connected to the other side of the generator. Glass micarta finger guides, set between the conductor rolls, in the space separating the anodes, prevent passing sheets from coming in contact with the latter. Level of the electrolyte, which is dilute hydrochloric acid, is maintained high enough in the tank to keep the lower portion of the top anode submerged at all times. Following the pickling tank, are two sets of rubber-covered wringer rolls with water sprays between them.

When employed in conjunction with a two-way tin stack, the vacuum cup feeder holds two piles of sheared plate, side by side. These piles are brought directly from the cutting lines by crane or lift truck, and set into proper position in the feeder so that the vacuum cups lift the sheets individually, and enter them two abreast into a set of rolls which feed them into the electrolytic pickling tank. As the sheets pass through the conductor roll assemblies and between the anodes, the electrical circuit is completed, and any oxides on both surfaces of the plate are removed. Current up to 500 amperes at 8 volts is applied. Sheets then pass through the sprays and wringer rolls where they are washed, and excess water wrung off. A magnetic conveyor then transports them directly to the tin pot and feeds them into the Davis feeder.

Piles of tin plate, transferred from the tin house to the assorting department, are set up on steel tables for visual inspection by trained women who examine both sides of all sheets, and classify them into three main grades; prime plate, menders and waste waste. Prime plate is the grade which is shipped against the order. It is counted, or reckoned off, by men called "reckoners" into what is known in the industry as packages, or units of 112 sheets. He piles these packages as he counts them, on a wooden pallet, the top of which has about the same dimensions as the plate and is about an inch thick, until the lift or "bundle," as it is called, contains the required number of units specified on the order. A standard bundle contains 10 packages, and will weigh on the average slightly more than a ton. Some purchasers, however, specify as many as 15 packages to the bundle, while in the case of some export orders the bundles contain only 5 packages.

When the reckoner has finished piling down the required number of packages on the pallet, the bundle is made ready for storage in the warehouse or loading in a box car. Steel angles, backed with cardboard, are placed at the four vertical corners and four top edges of the lift for protection against damage in handling. Wire, about $\frac{1}{8}$-inch in diameter, or steel bands, $\frac{3}{4}$-inch wide and 0.028-inch thick, are applied horizontally and also lengthwise and crosswise around the bundle to secure these angles in place. Suitable tools are used to make these wires or bands tight. An open-bottom carton, made of corrugated cardboard, is then placed over the lift, and another set of wires or steel bands is applied lengthwise and crosswise around the bundle, and made tight. The bundle is securely fastened to the pallet, since all the crosswise and lengthwise bands wrap around the pallet, suitable slots being provided in the runners of the latter to permit the bands or wires to pass through. Size, base weight, temper and other pertinent information is stencilled on the top and four sides of the bundle, after which it is removed by lift truck to the warehouse for storage prior to shipment.

In the case of tin plate destined for coastal areas or for export, a metal case of sheet iron is used instead of the corrugated cardboard carton, with the tin plate underneath being carefully wrapped in moisture-proof paper. A considerable amount of tin plate for export is still being packed in light wooden boxes with paper wrapping on the inside, and wires or steel bands applied lengthwise and crosswise to the outside. In such shipments, the plate is generally packed 112 sheets to a box.

Menders, which are sheets that have coating defects, are re-pickled, re-tinned and re-assorted. Waste waste is irreparably defective plate, and is sold for miscellaneous uses, either in bundles or 2000 pounds, or wood boxes containing 200 pounds.

Manual handling involved, in assorting and reckoning finished tin plate, has been eliminated, to a very great extent, by recent installations in some tin mills of continuous assorting lines. One type is located at the exit end of, and in line with, the tinning stack branner. Sheets, emerging from the branner, are deposited on a conveyor which transports them to an inspection wheel consisting of six equidistant rows of spokes in a hub mounted on a shaft which is rotated by a magnetic clutch. The inspection wheel remains stationary, until an entering sheet trips a switch, located about 2 inches from the hub, thereby closing the circuit in which the magnetic clutch is wired.

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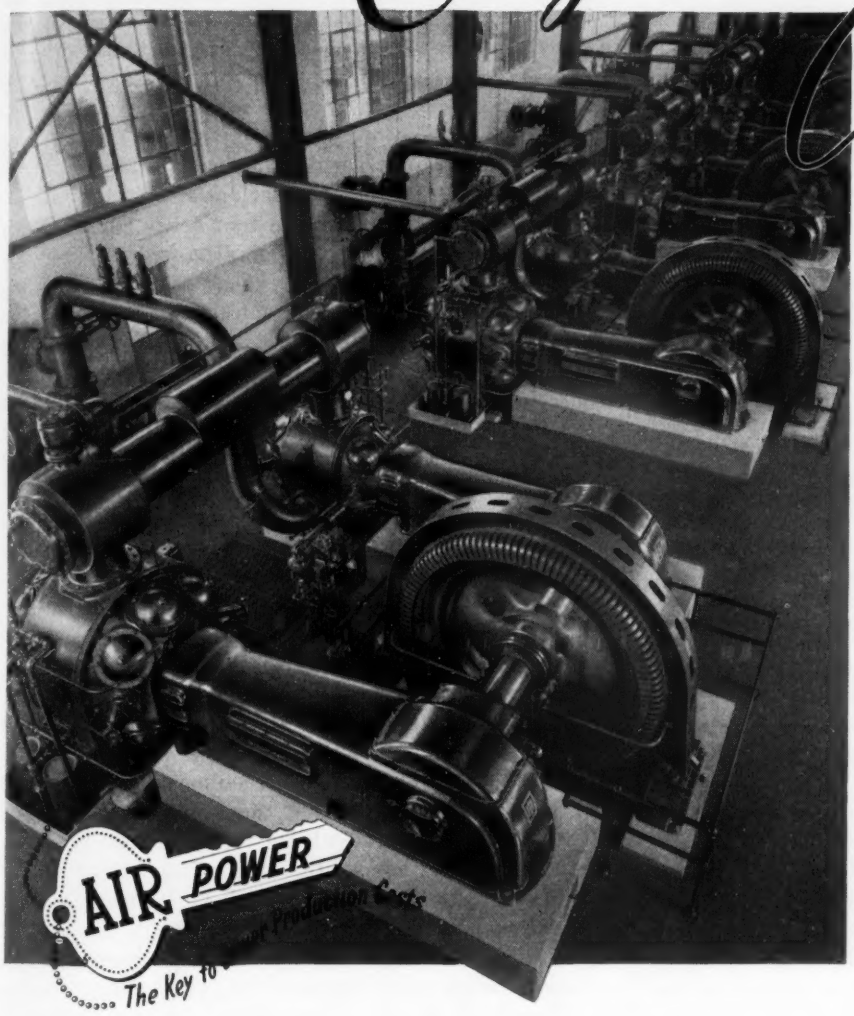

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Fig. 10—Bundles of finished tin plate in warehouse which are ready for loading in box cars. Metal cased bundles at right are for export

A cam arrangement limits the consequent rotation of the inspection wheel to an arc of 60 degrees, thus requiring the entry of six sheets to produce one complete revolution. As a sheet enters the inspection wheel, the inspector, who is stationed at that point, gets a clear view of the top side. When the sheet has been rotated 120 degrees, its bottom side comes into plain view for inspection. Rotation of 180 degrees, deposits the sheet on a conveyor which carries it away from the inspection wheel. This last conveyor is equipped with three pilers, one for menders, the second for waste waste and the third, located at the end of the line, for primes. The inspector has at hand two pushbuttons, one for opening the flap gate directing menders into the mender pile, and the second for opening the flap gate directing waste waste into the waste waste piler. A mechanical counter, located just ahead of the prime piler, counts the primes. When the required number of sheets have been piled up on the wooden pallet placed in the prime piler, the lift is pushed out on a conveyor where it is weighed, packaged and stencilled with the proper markings, and is then removed by lift trucks to the warehouse. Menders and waste waste are disposed of in the same manner as when hand inspected.

Still another type of continuous assorting line employs the principle of directing the sheet into an upright position between two mirrors set at an angle to each other, thereby permitting the inspector, who is stationed at that point, to see the reflection of both sheet surfaces. Menders and waste waste are diverted by flap gates, manipulated by the inspector, into appropriate pilers in the same manner as above.

In a third type of continuous assorting line, sheets travel in a straight path by means of a magnetic conveyor. At the inspector's station, a mirror, placed in a horizontal position about a foot below the conveyor, gives a reflected view of the bottom side of the passing sheet. The last two types of assorting lines described above are employed as independent operating units, and have their own feeding equipment, generally of the vacuum cup type. Piles of tin-coated sheets are transported by lift trucks or crane from the tinning department to these assorting lines.

After temper rolling, coils, which are to be tin coated by the electroplating method, are transported by crane or lift truck to a side trimming line which trims off a predetermined amount from both sides of the band, leaving its width equal to one dimension of the finished tin plate. This line comprises the conventional type uncoiler which unwinds the coil, a side trimmer which trims the sides of the band and is the same type as used in the cutting line, a trip shear that cuts off and squares up the coil ends, a lap welder which welds the front end of the fresh coil to the tail end of the preceding coil thus permitting a continuous flow of steel, and a reel of the same design as used at the temper mill for again winding up the band into a coil. The side trimmings are compressed into bales which go back to the open hearth to be remelted.

The purpose of this side trimming operation is to avoid coating with expensive tin, steel which must be trimmed off at some later point in the process, if not at this point. This operation is usually carried out at speeds up to 2000 feet per minute.

(To be continued)

Welds Stress Relieved In Car Bottom Furnace

Designed for close temperature control and providing for uniform heat throughout the work chamber is a recently installed recirculating type car bottom furnace, installed in the plant of Bath Iron Works, Bath, Me., for solution heat treating and stress relieving of aluminum gun foundations and the stress relieving of steel weldments and high pressure piping. Working dimensions of the new installation are 12 x 18 x 25 feet.

Car forms the furnace floor and has special heat sealing edges. The electric car pull is said to have a maximum speed of 20 fpm. Two 3,000,000 Btu per hour oil heaters furnish the heat. Capacity for stress relieving steel weldments and high pressure piping is 12,000 pounds; for aluminum gun foundations it is 5400 pounds plus 2000 pounds of steel jigs and fixtures.

Stainless Use Eliminates Six Operations

Smaller of two parts brazed together for assembly in water coolers formerly was fabricated from stainless sheet, but would not withstand the heat generated during the joining operation. As performed in the plant of Primor Products Inc., Addison, Mich., seven fabrications operations were required for making the smaller part from sheet stock.

Finding it possible to make both of the parts from stainless steel tubing, instead of the previous one, enabled the company to reduce the fabricating operations on the smaller part to one. It has been found that although the material, type 304 stainless steel tubing, made by Carpenter Steel Co., Union, N. J., costs more than the sheet originally used, savings in production time offset the increased cost of material. The high rate of rejection after the silver soldering previously encountered has been eliminated.

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DIVISION of BLAW-KNOX COMPANY - PITTSBURGH, PA.

LEWIS PLAIN CHILLED IRON ROLLS

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MANUFACTURERS OF ROLLS AND ROLLING MILL MACHINERY FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

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Flame Hardening

(*Concluded from Page 67*)

essary hardness on items where shape or design would not permit a vigorous or full quench for full surface hardness in plain steels. With flame-hardening, such parts can be made of plain carbon steels giving the necessary hardness without the dangers involved in fully quenched work.

Alloy Additions—When core physicals have to be higher than those of annealed carbon steels, however, alloy additions are used. The steel may be heat-treated in the rough by normalizing or liquid quenching to the machining range of 250-350 Brinell, and after machining, the required surfaces are flame-hardened. This gives a combination of very desirable physical values—a combination scarcely obtainable by any other process—and with flame-hardening failures from heat-treating are reduced to an absolute minimum. When parts are made of cast steels, and hardening is required on unmachined surfaces some decarbonization of the skin is usually found. To permit flame-hardening of such unmachined parts, the carbon range of the casting steel should be raised 10 points which will readily yield hardness of 450-550 Brinell.

For machined surfaces, the carbon range should be the same as for wrought steels, and the use of alloy steels should be governed in the same manner as for wrought materials.

When physical requirements are not high, or for economy production, cast iron may be used for many parts. Again increasing the wear resistance of the material is desirable; and to make this possible, we have to use what are termed pearlitic irons. These have a composition of combined carbon of 0.60 to 0.80 per cent plus other definite chemical combinations. A low silicon with a maximum total carbon of not more than 3.25 per cent will give a surface hardness of about 600 Brinell.

Additions of chromium, manganese, nickel, molybdenum and vanadium all refine the grain size of the irons and help to increase the hardening results. Table III gives several typical alloy compositions and the hardnesses obtained. Table IV gives similar data for the Meehanite irons. These commercial irons are of the sorbo-pearlitic class which has been found to harden to 400-500 Brinell very successfully.

Malleable Irons—With the malleable irons, we get our best results on a machined surface, as the cast surface has a considerable depth of decarburized metal which will only harden when enough time of heating is given to diffuse the temper carbon through this zone. Table V shows two typical compositions and the hardness results obtained by flame-hardening.

Few reasons exist for failure with an adequately planned and supervised flame-hardening department and every reason to expect success with the operation. The process is applicable to almost any surface to which the tip of an oxyacetylene torch can reach by one of the four basic methods of application. These basic methods—each of which has several variations—include: Spot method, unit area method, progressive method, spinning method.

Equipment for applying the process may be very simple or very elaborate, but except for mass production high capacity requirements, using what amounts to flame-hardening machine tools, it is usually made up of standard elements, combined to provide the least complicated, most readily adaptable type of setup. Thus, a portable-type cutting machine carrying the torch and quench will cope with the greater proportion of straight-line work; a lathe and a fixed torch will handle much circular work; and a variety of simple fixtures will accommodate more complex operations. Flame-hardening is, mechanically, such a straightforward operation that it is seldom necessary to go in for complicated means of applying it.

Japan's Steel Industry

(*Continued from Page 72*)

Balance of the available capacity was in theory at least to be taken for reparations. A comparable rolling capacity was to be allowed Japan, the balance again to be taken as reparations.

More sober counsel prevailed, however, and after much deliberation an allowed production of 3,500,000 tons of steel ingot per year was decided upon as the United States position on the subject. Assuming a reasonable allowance for repair, diversity of products and so on, that would leave Japan a capacity of perhaps 4 million tons of ingot, which is adequate for the near future. Insofar as any long term future is concerned, it is sheer nonsense to think that we can establish a fair production level for Japan, since we have no very firm idea of what even our own steel requirements will be.

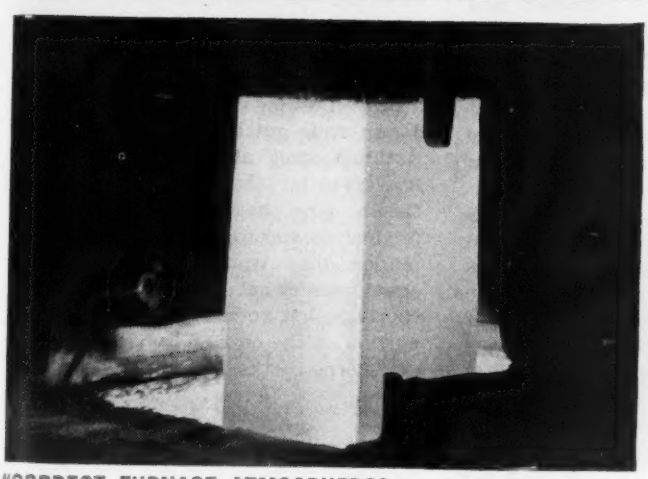
It was originally specified also that Japan be stripped of all electric furnaces of more than 1 ton charge capacity. This made little sense and has been repeatedly modified. It is probable that in the end there will be no restriction on electric furnace capacity as such. In steel rolling facilities, the latest American position would allow the Japanese an output of something over 2½ million tons per year, which under the same allowances for diversity of product and so on would probably mean a rated capacity of 3 to 3½ million tons a year.

Although the iron and steel facilities installed in Japan above the allowed capacity are scheduled for removal as reparations, it is difficult to see how any sizable portion could be removed and used. Rolling mills and other fabricating equipment would be practical but no country of Asia with the possible exception of India would have a place for them. It would be doubtful to say the least that we would want them. Any attempt to tear down and move blast furnaces and open hearth furnaces which have been in use anywhere from 5 to 40 years would be fantastically impractical.

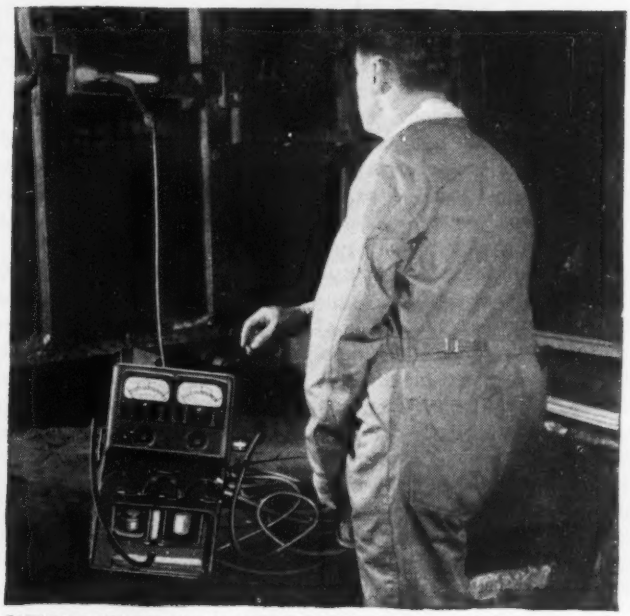
During the past several years of acute steel shortage, other allied nations have suggested utilization of steel plants among others in Japan, the products to be taken as reparations. While this method of according reparations has been extensively used by the Soviet in Europe, it was never considered to any degree in Japan.

While the administrative problems of taking reparations from production in an island country without raw materials would be enormously complex, the system would offer something of value by way of reparations —especially in Asia which needs the products but not the plants. As one example, Nationalist China could have obtained large quantities of metals and metal products badly needed in her war against the Communists had she been able to use in Japan the plants in that country presumably on the block for reparations.

Having dragged on so long without agreement, it is fairly likely that the whole matter of reparations from Japan's iron and steel industry may die a natural death. In that event Japan would be left with her present



"CORRECT FURNACE ATMOSPHERES so vital to steel production presented a baffling problem to us when we tried to control them scientifically. So we tried the Cities Service Heat Prover. Results were immediate. We got less scrap, less scaling plus more and higher quality production. Savings in fuel and time were also substantial."



CITIES SERVICE HEAT PROVER quickly analyzes combustion atmospheres of industrial furnaces regardless of type or size. It tells exactly how much fuel is wasted—how much energy is wasted in uselessly heating excess air or whether excess oxygen is present to cause scaling as in the heat treating of steel. *Write for a free demonstration today.*

Free a fact-filled booklet entitled "Combustion Control for Industry." Write Cities Service Oil Company, Room 467, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

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7 million tons or so of annual steel capacity, ranging in condition from good to very bad.

Future Competitive Position—Regardless of the iron and steel production level allowed Japan, a few features of her competitive position in the future may be assumed. First, Japan will not be much of a market for either steel or steel products because of very severe foreign exchange position in which she will remain for a good many years. Even high cost, and in some cases inferior domestic production will be favored over expenditure of scarce foreign exchange for imports.

Depending upon the course of the war in China, however, Japan might again become a market for pig iron. Her only sources of iron ore in the Far East are Hainan Island in China and Malaya, plus small quantities from the Philippines. The first is outside present Communist danger but may not remain so. The second is subject to the ability of the British to maintain order in Malaya. Iron ore from all of these sources costs more than $16 a ton landed in Japan. Coking coal comes almost entirely from United States at a cost of $24 to $25 a ton landed in Japan. Should American industry need an export market, it shouldn't be too difficult to beat the dollar cost of pig iron produced in Japan.

For the same reasons, it is unlikely that Japan will become a serious competitor in the export of steel to Far Eastern markets. Japan can and should export machinery and other metal products, but it is not likely that she can meet competition costwise on rails, sheets, bars and other primary steel products, once American and European mill prices prevail in the export market.

Since the major oriental sources of coking coal are in North China and well within the Communist lines, Japan will probably continue to purchase such coal from the United States. It is reasonable also to suppose that many of the Chinese coal mines have been badly used by constant warfare and neglect to a point where a period of years would be required for rehabilitation before large scale export production could be attained even if the political situation there can be resolved.

Although Japan was sufficiently a part of the war itself to have a good deal of scrap in the form of bombed equipment scattered all over the country, she will in all probability become a buyer of American scrap as quickly and to the extent that revival of the steel industry and the availability of foreign exchange permit. Scrap in the country is estimated at from 5 to 10 million tons, but it cannot be collected easily, nor do the Japanese have facilities to handle it efficiently.

Postwar Operations — Revival of iron and steel production after VJ day began slowly and has not made a great deal of progress to date. The postwar low amounted to practically a complete shutdown when in October and November of 1945 only three blast furnaces in the country were in operation and less than 10,000 tons of either pig iron or steel were produced per month.

The confusion attendant upon surrender was such that neither coal nor ore was delivered to the mills, resulting in a frantic banking of as many furnaces as possible. Postwar Japan is probably unique in the number of furnaces banked and the period over which they remained banked. Although a good deal of relining has been necessary, the experience has been less damaging than was originally expected.

Early attempts to get the industry back into production were surrounded by problems of every type. Continued lack of coal of any kind and inability to count on a regular supply made it most hazardous to put coke ovens and blast furnaces into operation. Lack of fuel oil and intermittent electric power supply combined with the use of poor domestic ore and haphazardly gathered and poorly prepared scrap made all production operations unsatisfactory and the resulting product usually very inferior.

Production in 1946 averaged only 17,000 tons per month of pig iron and 46,000 tons per month of steel ingot. In 1947 the monthly average was upped to 30,000 tons of pig iron and 78,000 tons of ingot, while for 1948 67,000 tons of pig iron and 142,000 tons of steel ingot were produced per month. Although the increase has been steady, the total output for 1948 was less than half of the low level permitted by allied policy, and lack of steel is actively holding back economic recovery. The railways and other public utilities are literally falling apart for lack of steel and other metals and plant rehabilitation is all but impossible for the same reason.

Of the 1948 yearly production of steel ingot which amounted to 1,700,000 tons, 1,157,000 tons were open hearth steel and 543,000 tons were produced in electric furnaces. The Bessemer plants did not operate. Ferroalloy output remains insignificant, averaging only slightly more than 2000 tons per month in 1948.

In finished steel, Japan's 1948 production averaged 105,000 tons a month of which 92,000 tons were rolled products. Plate, sheets, bars and wire rod were the leading products in that order.

The large percentage of ordinary steel output from electric furnaces is a wasteful process even in a country of relatively cheap power, and represents a demand for as much power as the industry can get rather than a planned production program. Power consumption in the industry was 141 million kwh in 1946, 144 million kwh in 1947 and 157 million kwh in 1948.

In view of the extremely tight steel situation, only recently relieved, it was surprising that our authorities in Japan failed to get Japan's steel industry back into production and rehabilitated on a basis of export sale. In spite of proposals from many American firms to supply the coal, iron ore and so on and take steel products in return, all such proposals were denied and total exports from Japan amounted to no more than perhaps 50,000 tons. Our authorities in Japan also denied proposals from American firms to utilize idle plant capacity in Japan on a rental or royalty basis.

Significantly, therefore, while President Truman was calling the American steel industry to account for not having enough capacity and threatening to put the federal government in the steel business, that same government was sitting on some 6 million tons per year of idle capacity in Japan. The ways of bureaucracy are sometimes hard to understand.

Since the few exports allowed from Japan were priced by General MacArthur's staff at top gray market levels (better than $200 per ton for sheets, pipe, barbed wire etc.) the production and export sale of several million tons would have not only eased somewhat the acute world shortage, but could have paid a good portion of the cost of the occupation, now borne by the American taxpayer.

—o—

Size range of products which can be injection molded in one piece from thermo-plastics is increased with the 48-ounce single shot injection molding machine introduced by Watson-Stillman Co., Roselle, N. J. Paralleling the trend towards large capacity injection molding, the machine is provided with an automatic stuffing arrangement which is said to increase its rate of capacity by 40 to 50 per cent. The hydraulic machine has a stainless steel hopper which receives an entire barrel of plastic and which is processed at the rate of 200 pounds per hour.

New Products and Equipment

Grinder, Polisher

Any flat metal blank or strip up to 10 inches wide may be given a full range of finishes from a rough grind to a high polish with the model 600 Straight-O-Matic grinding and polishing machine, offered by Curtis Machine Division, Lincoln Park Industries Inc., Jamestown, N. Y. Small flat parts may be fed manually, by conveyor belt or equivalent means. Additional high speed production on all types of work may be secured through tandem installations performing both grinding and polishing operations in a continuous run.

Abrasive belt tension control and tracking device are conveniently ac-

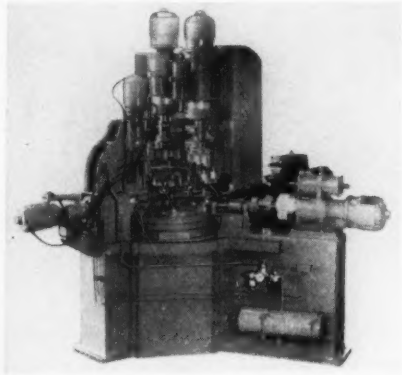
cessible for quick belt change and alignment. The 4-inch diameter, Neoprene-covered contact roll has double roll shielded high grade ball bearings. Both the 2-inch diameter hardened and ground steel billy roll and the 2¾-inch diameter Neoprene covered feed rolls have shielded ball bearings. Abrasive belt width may be up to 10 inches and length is 111 inches. Belt speed with a 1200 rpm motor is 5140 fpm.

Check No. 1 on Reply Card for more Details

Drill Unit

Powered by a combined air-hydraulic system which incorporates a sealed unit construction and permits operation in any position is the No. 5 model drill unit, offered by Cleveland Republic Tool Corp., Cleveland, O. Unit design and construction conforms to the modern tooling practice of grouping single units on simple welded bases. Units may be used for drilling, centering, countersinking, facing and milling operations.

Drill spindle thrust is provided by the plant's air system or an auxiliary supply. Operating principle is based upon a rapid advance to an accurate stop, then metered hydraulic feed to another stop and rapid return. Rapid advance travel is consistent to 0.005-inch and work

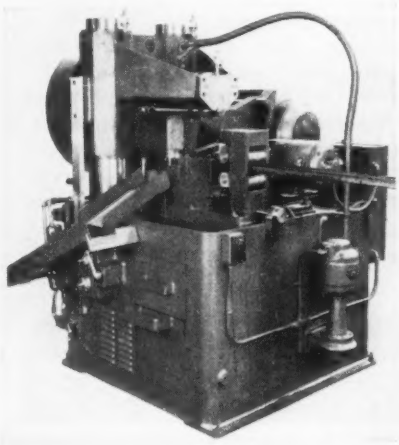


feed to final depth holds to 0.001-inch. Unit is available in 2 to 5 hp and has a maximum stroke of 6 inches. Spindle is normally furnished with a No. 4 Morse internal taper and the quill is designed to be adaptable to multiple spindle drill heads.

Check No. 2 on Reply Card for more Details

Bar Feed Milling Unit

Kent-Owens Machine Co., Toledo, O., is producing an automatic bar feed machine for cutting off or multi-milling operations. Bar is placed in the fixture and the operation is as follows: The head, which carries the



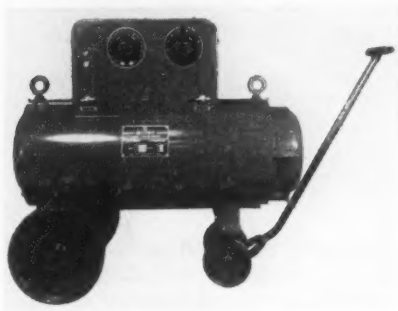
cutter, travels in a down direction until the cutter approaches the parts to be milled or cut off. At this point the head automatically goes into feed, and feeds until the part is cut off or milled. It then reverses and returns in rapid traverse.

During the reverse stroke the finished parts are automatically ejected and the bar is moved into place so that the next part can be milled. This operation is continuous until the bar is used up.

Check No. 3 on Reply Card for more Details

Welding Generators

Available either as engine driven or electric motor driven units is a series of alternating and direct current welding generators announced by Miller Electric Mfg. Co., Appleton, Wis. Direct current models have a welding current range from 30 to 400 amp while the alternating current model range is from 15 to 300 amp. Both feature dual controls, separate excitation, instantane-



ous voltage recovery and easy arc starting.

Engine driven alternating current models are available with built-in high frequency for Heliarc welding. They are powered by either Wisconsin 4-cylinder air cooled engines or LeRoi 4-cylinder liquid cooled engines. Also offered is a towing trailer for use in field operations. Direct current models are available with the same type engines. Motors are of the squirrel cage type with cast aluminum rotor, across the line starting and operation on 220 or 440 v.

Check No. 4 on Reply Card for more Details

Speed Control

Speed Selector Inc., 118 Noble Ct., Cleveland 13, O. is manufacturing a 1 or 2 hp 6:1 ratio variable speed control which uses standard B-belts with fixed centers any distance. Complete assembly includes two variable pitch sheaves and control. A spring-loaded sheave is mounted on the motor shaft while the control sheave is mounted on the driven shaft. A regulating mechanism consisting of a hand wheel and bracket, adjustable to any application, opens and closes the control sheave.

Changes in pitch diameter cause

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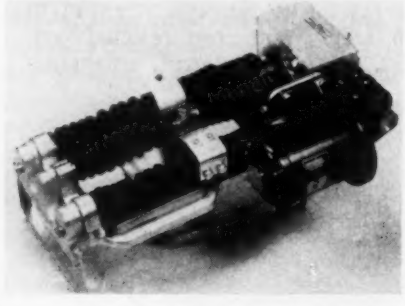
the standard V-belt to actuate the spring-loaded motor sheave, thus giving stepless speed control over a 6:1 range. Remote control can be applied. Correct belt alignment is maintained at all speeds. Sheaves can be obtained separately for V-belt to flat pulley drives. Lubricant cavities are large and accessible.

Check No. 5 on Reply Card for more Details

Buffing Applicator

An improved buffing compound applicator, offered by George L. Nankervis Co., 5442 Second Blvd., Detroit 2, Mich., has all moving parts enclosed by means of Neoprene boots on the feed screw and slides. This eliminates the possibility of mechanism clogging with buffing compound, lint, etc. Weighing but 22 pounds, the applicator can be installed at any angle on any automatic polishing machine. It has an intermittent feed operating at the rate of 14 strokes per minute.



Machine is driven by a totally enclosed, geared head motor available for operation on 110 v, single phase or 220 or 440 v, 3 phase, 60 cycle current. Standard carrier will accommodate any compound up to 4 inches wide, 2 inches thick and 24 inches long. A special carrier will take cakes up to 6 inches wide.

Check No. 6 on Reply Card for more Details

Jointer

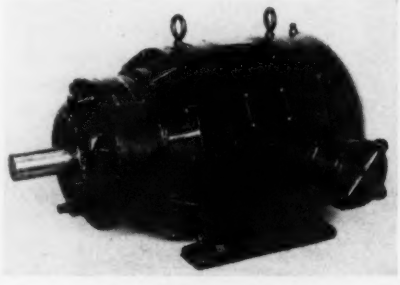
Capacity of the 6-inch jointer made by Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J., is 6 inches wide and, doing rabbetting work, up to ½-inch deep. A dual purpose guard enables operator to plane stock ribbon thin or in narrow strips with safety. A rear knife guard keeps the three knives covered at all times, regardless of fence position.

Tables are of heavy gray iron castings and have precision milled tops. Cutterhead is of solid steel, ground and dynamically balanced and is 2½ inches in diameter. Height from floor to table is 34½ inches. Machines are offered with dual purpose guard triple belt drive and direct-mounted motor bracket or with flat type conventional guard and single belt drive.

Check No. 7 on Reply Card for more Details

Gear Heads

Universal gear heads made by Universal Gear Corp., 19th and Martindale Ave., Indianapolis 7, Ind., are designed to fit standard NEMA type C motor flanges without any special parts or machining except to shorten



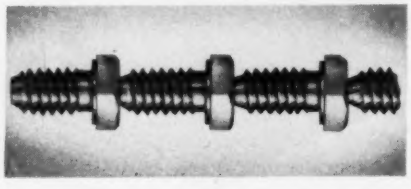
length of motor shaft extension. Unit is concentric and compact, with gear ratios from 3:1 to 80:1 in a single stage reduction. Reduction ratio of a given drive can be readily changed by replacing one gear head with another and, for most ratios, mounting on the same motor.

A flexible coupling is used between the motor and gear head, permitting a reasonable amount of misalignment without undue vibration or noise. Reduction gearing is of helical planetary design up to 16.2:1 and the heliocentric principle is utilized in ratios of 20:1 to 80:1.

Check No. 8 on Reply Card for more Details

Screwsticks

Faster, simpler and more efficient fastening is made possible with a one-piece stick of identical small screws manufactured by American Screw Co., Providence 1, R. I. Used in pneumatic, electric, spiral or handratchet drivers, the screws are twisted off automatically from the screwsticks and the fastening made when



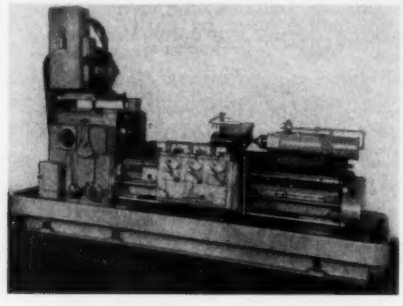
a predetermined torque is reached. Constant measured torque provides uniform tightening, eliminating guesswork by operator or machine.

As the tightened screw is freed from the neck, the next screw in line is automatically advanced. Amount of torque is controlled by cross-sectional area of neck joining the screws. Head of driven screw is burnished smooth by the next screw to be driven. Screwsticks are offered in No. 0, 1, 2, 3, 4 and 5 diameters in mild steel, brass and aluminum.

Check No. 9 on Reply Card for more Details

Multiple Turning Lathe

Multiple slide front turning carriage on the model AP high speed multiple turning lathe made by Seneca Falls Machine Co., Seneca Falls, N. Y., operates on the rack and pinion feed principle, permitting longer cuts than are possible with closed cycle lathes. Heavy stock removal with sintered carbide tools is possible, due to the balanced twin rack



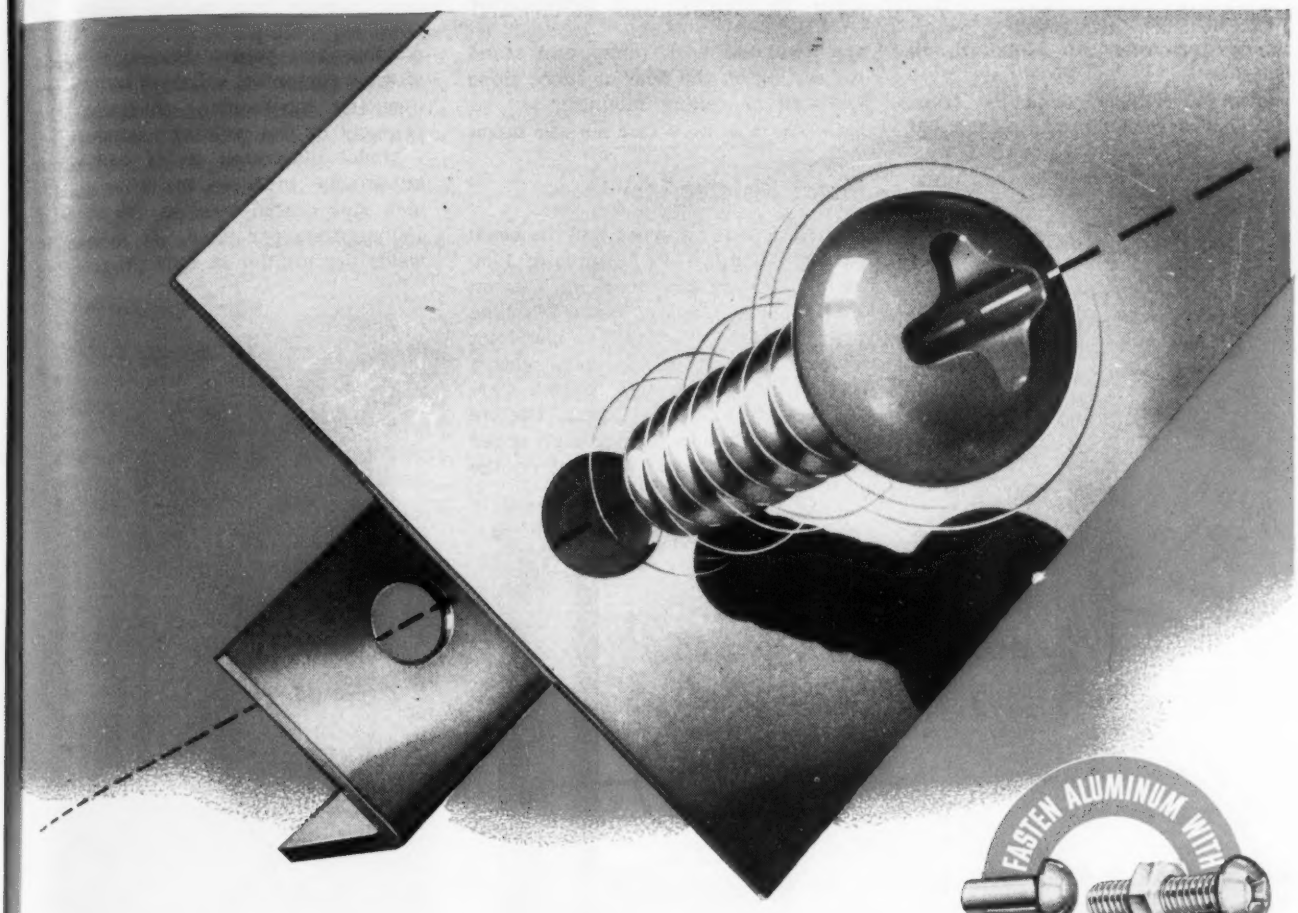
pinions meshing with the heat treated steel rack and which cuts the unit tooth pressures in half.

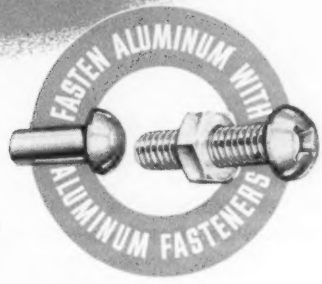
Lathes may be used for shaft work involving long shoulder lengths where overlapping of cuts is not desirable. It may also be used on short run jobs. Carriage cross slides are power operated and individually controlled. Other features include automatic feed throwout coupled with automatic tool relief, rapid traverse movements for longitudinal carriage feed and cross slides and for the automatic back attachmeent, manually-operated safety feed clutch which stops all feeds in case of tool breakage and heat-treated headstock spindle mounted on heavy-duty ball bearings. Pulley shaft is equipped with multiple disk clutch and brake, permitting continuous rotation of electric motor and instant stopping of headstock spindle.

Check No. 10 on Reply Card for more Details

Tool Balancer

Tools may be balanced in any suspended position within the range of a tool balancer made by Platz Co., 20433 Sherwood Ave., Detroit 12, Mich. Tools remain stationary without any up or down creep and can be moved up or down with slight pressure. Unit hangs from a fixed point or is equipped to operate on a standard 4 or 6-inch I-beam, Cleveland





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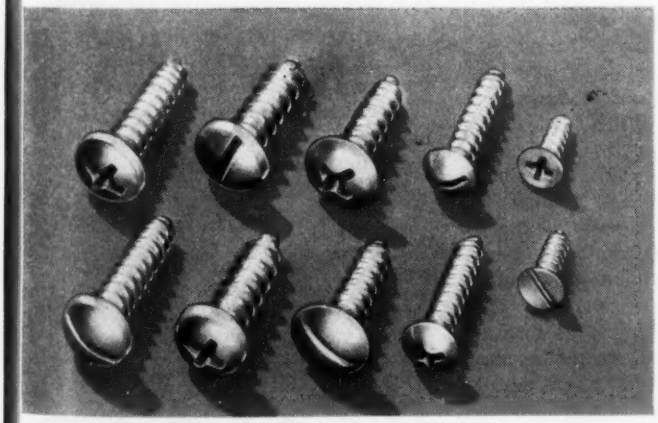

FREE! Samples of Alcoa Aluminum Fasteners sent free when you request them on your letterhead. Specify type and size you'd like.

Phillips heads add a big production plus—fast, slip-free power driving—to all the natural advantages of aluminum fasteners; corrosion resistance all the way through, bright modern appearance, light weight. And at prices that will surprise you.

Alcoa Aluminum Fasteners make possible strong, tight joints with aluminum assemblies. They prevent the galvanic action that can result when dissimilar metal screws are used to fasten aluminum.

Alcoa Aluminum Screws are available in sheet metal, wood and machine screws, standard sizes and lengths, in all popular head types. Other aluminum fasteners, too: hex head bolts, washers, hex nuts, cap nuts, wing nuts, castle nuts, in standard sizes and threads. ALUMINUM COMPANY OF AMERICA, 620H Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA

ALCOA *Aluminum* FASTENERS®

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
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Tramrail or American Monorail, as desired.

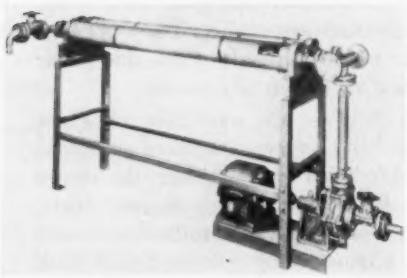
Balancer swivels vertically from 0 to 17 degrees and will rotate 360 degrees. It is equipped with a conduit tube to support inlet hydraulic hose or electric cable to portable tool being balanced. Balancers are made in ranges of 36 and 42 inches

for tools weighing from 10 to 500 pounds and operating on 100 pound air line pressure. An adjustable weight tool balancer is built for installation with interchangeable equipment of a wide weight range.

Check No. 11 on Reply Card for more Details

Heat Exchangers

Use of the same unit for both heating and cooling of the electroplating solutions, as operating conditions require, is possible with the line of unit heat exchangers developed by Industrial Filter & Pump Mfg. Co., 1621 W. Carroll Ave., Chicago 12,



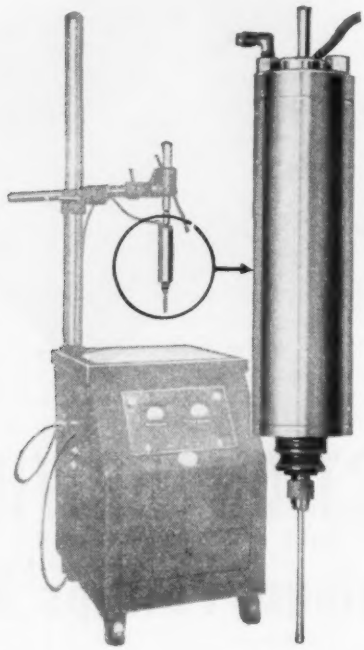
Ill. Exchangers use pure nickel tubes for nickel solutions and steel and special alloy tubes for other applications.

Heat exchangers can be furnished as a unit with a combination of from one to six tubes in multiple for a wide variety of capacity. Special units may be engineered for unusual capacity or space requirements. They are available with pump and stand for setting on the floor or tubes alone for wall or ceiling mounting.

Check No. 12 on Reply Card for more Details

Metal Disintegrator

Greater cutting speed and die work cutting accuracy are features of 1950 Metal Master, produced by Clinton Machine Co., Clinton, Mich. Machine will remove ⅜-inch ⅝-inch-long broken taps in 60 seconds, cut a 0.155-inch hole through ¼-inch Carboloy in 5 minutes, ⅜-inch Stellite in 40 seconds and ¾-inch high speed steel in 60 seconds. A collet on the



machine enables use of a 9-inch Thomlium electrode which may be moved out from the collet as the cutting depth increases. Accuracy is said to be from 0.003 to 0.005-inch.

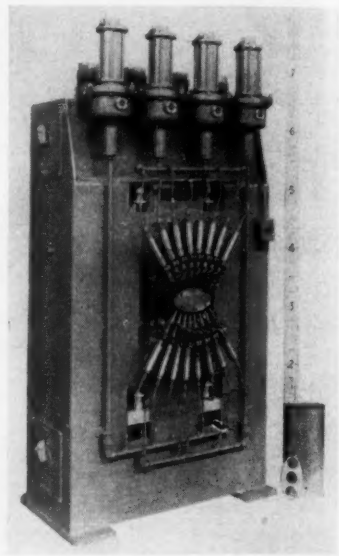
High cutting current of 50 to 200 amp is supplied to the electrodes but not to the solenoid coil, which is fed by low-voltage current. Speed of the head is electronically controlled. Other uses include cold welding cast iron without cracking, arc welding, arc brazing and soldering, drill pulling, air extraction of broken metal pieces, and etching on metal for identification purposes.

Check No. 13 on Reply Card for more Details

Resistance Welder

Air-oil boosters operating through air valves working in sequence and connected to the main air supply to provide welding force take advantage of the compact hydraulic gun in the Air-Speed type multiple electrode resistance welder designed by Taylor-Winfield Corp., Warren, O. Each welding gun passes welding current when a contactor, actuated by the sequencing mechanism, energizes the primary of the welding transformer.

Model illustrated welds baffles in automobile mufflers made of 0.040-inch zinc coated steel at the rate of 480 mufflers per hour. It makes 16 welds per muffler in four progressive

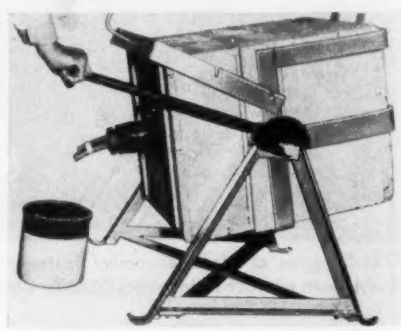


groups of four welds per group for a total of 7680 welds per hour. Sequence welding of the type used in this machine eliminates the need for an internal expanding work arbor. Each of two 50 kva transformers makes two series welds per group.

Check No. 14 on Reply Card for more Details

Carboy Tilter

A locking device which permits the carboy to be held at any angle for pouring and a safety air vent pouring spout that insures an even flow of acid without splashing, are safety features incorporated in the carboy



tilter made by General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa. It fits carboys of any size. Cradle and supporting base are made of structural steel and all members are riveted or welded to form a strong unit.

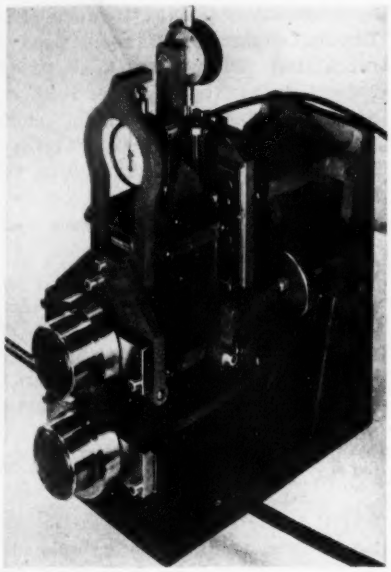
Pouring spout is made of acid re-

sistant rubber and plastic tubing. Flow capacity is 5 gallons per minute. A long handle operates the tilter and permits operator to remain at a safe distance from the acid. It can be safely left in a position just above the flow of the acid, so that it is not necessary to return carboy all the way to a pouring position.

Check No. 15 on Reply Card for more Details

Continuous Gage

Thickness of the plastic coating deposited on copper electrical wire is automatically controlled with the model 493 B-59 continuous measuring gage developed by Federal Products Corp., 1144 Eddy St., Providence, R. I. Called the Electricator, it



transmits electrical impulses when dimensions are out of tolerance, automatically controlling the machine so that a uniform coating thickness is maintained.

If desired, a thickness recorder can be installed to keep a continuous record of machine fluctuation, down time, etc. Parallel rollers contact the coated wire and maintain their parallelism regardless of thickness. Pressure of rollers can be varied to suit hardness of coating material. Machine can be adapted to other types of material besides wire.

Check No. 16 on Reply Card for more Details

Conveyor Lubricator

J. N. Fauver Co. Inc. 49 W. Hancock, Detroit 1, Mich., is manufacturing self-contained grease lubricators for conveyors, of the type that requires no external power for operation. Driven by contact with the trolley wheels, the lubricator is made of castings throughout wherever practical. A transparent plastic reservoir

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The fact that the cost of "Automatic" Sprinkler protection at Buhl Sons Company, Detroit, Michigan, will be paid for by means of reduced insurance rates in about 15 years (nearly 7% per annum), substantiates their acceptance as *Savings.*

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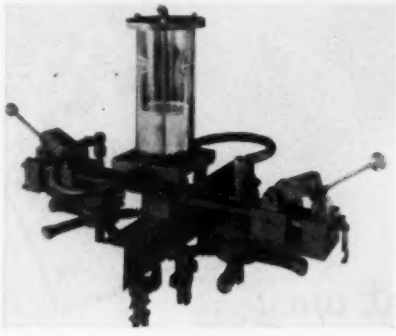
acts as a liquid level gage. A quick-release lever for taking the lubricator out of service and optional spring follower or air pressure on the reservoir for forcing lubricant into the pumping units are featured.

In operation, as a trolley wheel approaches the lubricator, the hub engages sleeve of one of the five pumping units which is automatically brought into contact with the wheel



bearing. Continued rotation of the lubricator forces the pumping unit inward, delivering a measured quantity of lubricant through the fitting to the wheel bearing. The process is continuous as long as the conconveyor is in operation.

Check No. 17 on Reply Card for more Details

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FILTER AID: A filter aid approved for use with the du Pont high speed copper plating solution is available under the tradename Solka-Floc from Brown Co., New York 18, N. Y. Complying with du Pont recommendations, it is precoated from aqueous slurry and then washed in place in the filter by circulation of hot water for about 1 hour prior to contact with plating solution.

Check No. 18 on Reply Card for more Details

COATING: Arco Co., Cleveland 14, O., introduced a new two coat prefab exterior sand finish system which is used to produce a sand finish or stucco effect on walls. Finish coat is an alkyd resin with titanium pigments and silica and is designed for spray application in the field over a shop coat for which a special zinc chromate primer is used.

Check No. 19 on Reply Card for more Details

BORING TOOLS: To make it easier to bore deep holes with precision, Bokum Tool Co., Detroit 21, Mich., has developed a new line of single point boring tools made of solid tungsten carbide. Ten sizes make up the line with shank diameters ranging from 3/32-inch to ½-inch; overall lengths from 3-inches to 7¼-inches; minimum boring diameters, 0.005 to 0.600.

Check No. 20 on Reply Card for more Details

PANELETTES: Square D Co., Detroit 11, Mich., announces a new 12 to 20 circuit MO panelettes with plug-in circuit breaker units. They are available in 12, 16 and 20 circuit combinations for either three or four wire service. Boxes are 12 inches wide and 4 inches deep, permitting, surface or flush installation in shallow walls with studs on 16-inch centers.

Check No. 21 on Reply Card for more Details

FIXTURE CLAMP: A new fixture clamp developed for clamping a casting through the bored hole onto a pilot plate is announced by Morton Machine Works, Detroit 20, Mich. Clamping is done by an alloy tee bolt engaging a hardened insert which is furnished with the clamp. Insert is ground for a press fit in the bottom of the pilot plate.

Check No. 22 on Reply Card for more Details

WHEEL CHOCK: Designed by safety engineers to hold trailers securely against loading docks and prevent dangerous up-ending between loading docks and trailers, a new safety wheel chock is introduced by Planet Corp., Lansing 6, Mich. It weighs 6½ pounds and is 8 inches high.

Check No. 23 on Reply Card for more Details

PLATFORM BOX: New, heavy duty, all steel corrugated platform boxes, built to any size have been developed by Palmer-Shile Co., Detroit 27, Mich. Boxes can be handled by lift truck and may be tiered to any height. Crane lugs, stacking brackets and channel runners are optional.

Check No. 24 on Reply Card for more Details

CALCULATOR: Applicable to either surface broaches or round, spline, serration and keyway broaches, a slide rule type calculator is offered by Colonial Broach Co., Detroit 13, Mich., to determine force required for broaching any part of cast iron, various types of steels, bronze, aluminum, magnesium or plastics. It can be used to check suitability of machine for any given job, capacities of machines required, etc.

Check No. 25 on Reply Card for more Details

COUPLINGS: Morse Chain Co., division of Borg-Warner Corp., Detroit 8, Mich., has developed a line of stock silent chain flexible couplings designated as series DSC. Disconnection is accomplished by unwrapping of chain after removing single connecting pin or by moving either sprocket endwise out of mesh with the chain. Stock bores range from ½ to 27⅞-inches with capacities up to 119 hp at 2000 rpm.

Check No. 26 on Reply Card for more Details

VALVE: A new four-way Mastair valve of the balanced spool type, controlled by one four-way or two three-way pilot valves, is announced by Hanna Engineering Works, Chicago 22, Ill. Parts are interchangeable in any size. Capacities of ⅜, ½, ¾ and 1-inch are of fully rated pipe size.

Check No. 27 on Reply Card for more Details

CARBIDE BLANKS: A new standardized line of solid cemented carbide blanks specially designed for pulley grooving tools is announced by Carboloy Co. Inc., Detroit, Mich. Blanks, designed for tools used in machining pulleys for A, B and C type V-belts (both 34 and 38 degrees), are available from stock. Thickness for all sizes is standard at 5/16-inch; length ranges from 1 to 1½ inches.

Check No. 28 on Reply Card for more Details

SEAM TESTER: For quickly locating leaks in pipes, tanks or other storage vessels, American Pipe & Steel Corp., Alhambra, Calif., introduced the vacuum seam tester. Testers are available in a wide variety of sizes and shapes.

Check No. 29 on Reply Card for more Details

STEP LADDER: An automatic safety feature of the new mobile step ladder, produced by Ballymore Co., Bryn Mawr, Pa., is that when a person steps on the ladder, the rubber tipped legs come in contact with the floor, preventing rolling action. They are made in standard sizes from one to six steps out of aluminum finished steel.

Check No. 30 on Reply Card for more Details

DIE HEAD: Geometric Tool Co., New Haven 15, Conn., introduces a rotary taper die head in three different styles: Style KT for conventional taper pipe threads; KTR for reverse taper pipe threads; KTI for straight threads.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

DEMAND FOR STEEL is showing some additional strength and the trade is attempting to determine whether business stabilization has been attained, whether a recovery is beginning, or whether the additional buying is largely a protection against a possible steel strike.

Some of the new buying is coming from metalworking plants which have completed raw materials inventory reduction. This suggests that some stabilization is coming about. However, part of the new orders are flowing from steel consumers which have found it necessary to call back employees and step up production. This situation is being watched for clues as to a general business recovery. On the other hand, some consumers, particularly the automobile industry, are known to be laying in steel as protection against a steelworkers' strike in mid-September. Whatever the reason for the stronger current tone in buying it promises to make August a better month than most steel company executives had anticipated.

OUTLOOK—If protective buying is the principal reason for the slightly stronger demand for steel, cutbacks in demand would be likely next month if a steelworkers' strike is averted. The reductions might be fairly heavy in view of the protective efforts now being exerted by the automotive industry, largest consumer of steel. The automotive industry's requirements are being watched closely also as to the possibility of a production drop in the last quarter. Any important cutback in the automobile industry's needs would be reflected in a variety of products, especially sheets and bars.

CURRENT DEMAND— In greatest stringency today are pipe, galvanized sheets, and cold-rolled sheets. Some producers still find it advisable to retain quotas on the former two products. However, a fourth-quarter softening in demand for oil well casing is anticipated. Hot-rolled carbon sheets, while still in strong demand, can be obtained more readily than cold-rolled. Although demand for hot-rolled bars has strengthened somewhat they and carbon plates are reported to be moving the most sluggishly of all major products. In exceedingly tight supply only a short time ago, plates have become freer since the drop in railroad car building. Cold-finished carbon bars remain in easy supply. Alloy bars also continue to drag. Scattered upturns in demand for structural shapes have occurred but the overall demand is lagging. Manufacturers wire is in somewhat stronger demand.

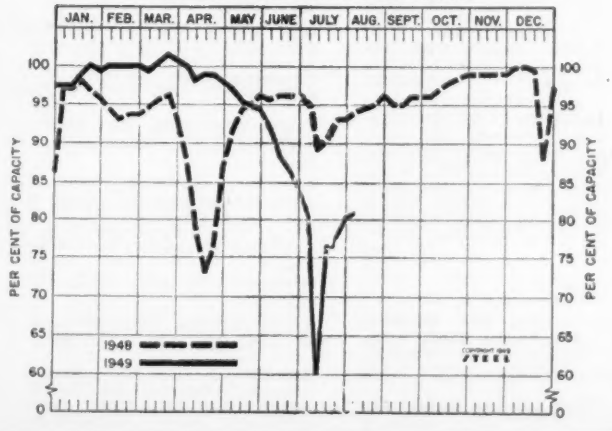
PRODUCTION— In response to the stronger undertone in steel demand, the ingot production rate is holding up well, last week's output increasing one-half point to an estimated 81.5 per cent of capacity.

PIG IRON— Foundry requirements of pig iron are slightly improved. Not only are more foundries operating now than in July when mass vacations reached a peak but some are reporting improved volume of business. A moderate rise in demand the rest of this year would not necessarily require an increase in merchant iron output, as producers are still stockpiling.

SCRAP— A strengthened undertone prevails in the scrap market as result of moderate new buying by foundries. This has pushed prices of cast grades up slightly and also is tending to impart some strength to open-hearth and blast furnace grades, although little buying is necessary on the part of steel mills. STEEL's price composite on steelmaking scrap last week remained unchanged at $19.34.

PRICES— Elsewhere on the price front there was little change. One producer finished wiping out the premium on its price of standard rails, and lead advanced a quarter of a cent. STEEL's price composite on finished steel remained unchanged at $91.82, semifinished steel unchanged at $62.12, and steelmaking pig iron unchanged at $45.60.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Aug. 6	Change	Same Week 1948	Same Week 1947
Pittsburgh	76.5	— 0.5	93.5	98.5
Chicago	89	+ 1.5*	90.5	94
Eastern Pa.	78	— 3	90	94
Youngstown	80	+ 8	103	92
Wheeling	92	None	92.5	93.5
Cleveland	96	+ 2.5	88.5	91
Buffalo	96	None	99	88.5
Birmingham	100	None	100	99
New England	55	+43	85	90
Cincinnati	91	None	103	87
St. Louis	75.5	None	80	84.5
Detroit	106	None	100	92
Western	80	+ 4	...	...
Estimated national rate	81.5	+ 0.5	94	95

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * From revised rate.

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MARKET SUMMARY
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COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 6	July 30	Month Ago July 1949	Year Ago Aug. 1948	5 Years Ago Aug. 1944
Finished Steel	$91.82	$91.82	$91.82	$95.05	$56.73
Semifinished Steel	62.12	62.12	62.37	75.75	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	44.12	23.00
Steelmaking Scrap	19.34	19.34	19.21	43.33	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Aug. 6, 1949	July, 1949	May, 1949	Aug., 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.45c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.79
Steel bars, Chicago mills	3.35	3.35	3.35	3.35
Shapes, Pittsburgh mills	3.25	3.25	3.25	3.275
Shapes, Chicago mills	3.25	3.25	3.25	3.25
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	3.48
Plates, Pittsburgh mills	3.40	3.40	3.40	3.50
Plates, Chicago mills	3.40	3.40	3.40	3.40
Plates, del. Philadelphia	3.5848	3.5848	3.6348	3.71
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.40
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	3.25
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.40
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Strip, cold-rolled, Pittsburgh mills	4.275	4.275	4.375	4.375
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	4.325
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.775
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.80

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$67.00*
Slabs, Chicago	52.00	52.00	52.00	52.00
Rerolling billets, Pittsburgh	52.00	52.00	52.00	59.00
Wire rod 7/32 to ¼-inch, Pitts. dist.	3.40c	3.40c	3.775c	3.775c

* Nominal. † 1.50 lb coating.

Pig Iron

	Aug. 6, 1949	July, 1949	May, 1949	Aug., 1948
Bessemer, del. Pittsburgh(N.&S. sides)	$48.08	$48.08	$48.08	$48.08
Basic, Valley	46.00	46.00	46.00	43.00
Basic eastern, del. Philadelphia	49.39	49.39	49.39	46.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	47.58
No. 2 fdry., del. Philadelphia	49.89	49.89	49.89	46.67
No. 2 foundry, Chicago	46.50	46.31	46.25	43.25
No. 2 foundry, Valley	46.50	46.50	46.50	43.50
Southern No. 2 Birmingham	39.38	39.38	39.88	43.38
Southern No. 2 del. Cincinnati	45.43	45.43	49.43	49.09
Malleable, Valley	46.50	46.50	46.50	43.50
Malleable, Chicago	46.50	46.50	46.50	43.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	62.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	170.20	148.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$21.00	$21.00	$23.25	$42.75
Heavy melt. steel, No. 2, E. Pa.	16.50	16.125	19.56	41.50
Heavy melt. steel, No. 1, Chicago	19.50	19.50	21.50	41.75
Heavy melt. steel, No. 1 Valley	19.50	18.50	22.00	42.75
Heavy melt. steel, No. 1 Cleveland	16.00	15.00	18.50	42.25
Heavy melt. steel, No. 1 Buffalo	20.75	19.50	22.81	46.56
Rails for rerolling, Chicago	27.75	27.75	27.75	64.13
No. 1 cast, Chicago	29.50	29.00	27.50	70.75

Coke

Connellsville, beehive furnace	$13.25	$13.25	$14.25	$14.38
Connellsville, beehive foundry	15.75	15.75	16.75	17.00
Chicago, oven foundry, ovens	20.00	20.00	20.40	20.40

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: Nom., per net ton, mill; sales in open market $50-$55 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & ¾-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.20c, Torrance, Calif. Basic open hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.10c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.25c, Plymouth, Mich.; 4.40c, Newark, N. J.; Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa., Kokomo, Ind.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.00c, Dover, O.; 5.05c, Torrance, Calif.; 4.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill except: 4.85c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.; 5.40c, Dover, O.

Galvannealed Sheets: 4.95c, mill, except: 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.

Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Detroit, Ecorse, Mich.;3.65c, Houston; 3.85c, Kansas City; Mo.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.10c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip: (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif., 5.75c, Los Angeles; 6.10c, Berea, O. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn.

Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston.
Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton and Harrison, N. J.
Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J.
Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, Mo., Torrance, Calif.; 4.15c, Minnequa, Colo.; 3.90c, Seattle.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.75c, Kansas City Mo.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.15c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 4.80c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago and Houston.

Galvanized (6 to 8 Gage base): 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.25c, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 122, Pittsburg, Calif., 123, Torrance, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 103, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 109, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 112, Duluth, Joliet; 116, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 106, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago and Houston.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6 in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
⅛-in.-1-in.	39 off	.....
⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
¾, ⅞, & 1 x 6-in. and shorter	35 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers. .Net to $1 off

For prices on stainless and tool steels please refer to Aug. 1 issue, Page 123.

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

In.	Butt Weld Blk.	Gal.	In.	Blk.	Gal.
⅛	39½–	11–	1	46½–	30½–
	41½	13½		48½	33½
¼	37½–	13–	1¼	47–	31–
	39½	15½		49	34
⅜	34–	9½–	1½	47½–	31½–
	36	12½		49½	34½
½	41–	23½–	2	48–	32–
	43	26½		50	35
¾	44–	27½–	2½, 3	48½–	32½–
	46	30½		50½	35½
			3½ & 4	44½	29

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2	40½	25	38½	23	28–	12½–
					3	23
2½	44½	29	41½	26	33½–	18–
					41½	26
3	44½	29	41½	26	36–	20½
					41½	26
3½&4	42½–	26–	43½	28	38½–	23–
	46½	31			43½	28
5 & 6	42½–	26–	43½	28	43½	28
	44½	29				
7					43½	27

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Gal.	In.	Butt Weld Blk.	Gal.
⅛	40½	12½	1¼	46–	32–
¼	38½	14½		48	33
⅜	35	11½	1½	46½–	32½–
½	40–	24½–		48½	33½
	42	25½	2	47–	33–
¾	43–	28½–		49	34
	45	29½	2½ & 3	47½–	33½–
1	45½–	31½–		49½	34½
	47½	32½	3½ & 4	43½	28

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2	39½	24	37½	22	27–	11½–
					37½	22
2½	43½	28	40½	25	32½–	17–
					40½	25
3	43½	28	40½	25	35–	19½–
					40½	25
3½-4	41½–	28½–	42½	27	37½–	22–
	45½	30			42½	27
5 & 6	41½–	28–	42½	27	42½	27
	43½	28½				
8	45½	29	44½	28	44½	28
10	45	28½	44	27½	44	27½
12	44	27½	43	26½	43	26½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Gal.	In.	Lap Weld Blk.	Gal.
⅜	+59	+90	1¼	+22	+47½
½	+20	+47	1½	+15½	+40
¾	+10	+36	2	+ 7½	+31
1 and 1¼	+ 4	+27	2½-3	+ 5	+26½
1½	— 2	+23½	4	List	+20½
2	— 2½	+23	4½-8	+ 2	+22
			9-12	+12	+31½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

UNIVERSITY OF MICHIGAN LIBRARIES

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.50	46.50	47.00
Milwaukee, del.	47.82	48.32	48.32	48.82
Muskegon, Mich., del.	....	51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	46.00	46.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Lorain, O., furnace	46.00	....	....	47.00
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	46.50	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Steubenville, O., furnace	46.00	....	....	47.00
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)			$59.50
6.51-7.00	60.50	9.01- 9.50	65.50
7.01-7.50	61.50	9.51-10.00	66.50
7.51-8.00	62.50	10.01-10.50	67.50
8.01-8.50	63.50	10.51-11.00	68.50
8.51-9.00	64.50	11.01-11.50	69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central Furnaces, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb, f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5½	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens.	
New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.76
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective June 1, 1949)	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do., tank cars	12.50
(Effective Oct. 25, 1948)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Oriviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.) Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton) Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.80‡	6.51	7.10	5.82	...	5.77	6.56	8.28	5.53	5.85	7.36
New York(c'try)	5.60‡	6.31	6.90	5.62	...	5.57	6.36	8.08	5.33	5.65	7.16
Boston (city) ..	5.70	6.70**	7.11	5.75	...	5.67	6.42	8.72	5.57	5.90	7.40
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.27	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.00-5.20‡	5.90[4]	7.00	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.85	4.85	6.52-6.68	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.18	5.18	6.82-7.01	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse)..	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.95	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.80	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[3]	5.90	6.35	8.10
Seattle-Tacoma.	6.70‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; ††as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c,

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.). $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.55c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

For prices of other ferroalloy products please refer to Aug. 1 issue, Page 125.

UNIVERSITY OF MICHIGAN LIBRARIES

Metal Price Tone Firms

Lead advances ¼-cent to 14.55c to 14.60c, St. Louis, as battery makers and die casters continue to take large tonnages. Satisfactory bookings continue in copper and zinc

New York—Volume of business being booked by leading nonferrous metal producers is satisfactory and sufficient to impart a firm price tone. Advance of ¼-cent a pound in lead on Aug. 2 has tended to bolster buying interest. Leading consumers of lead, as well as copper and zinc, are anxious to replenish inventories which had dropped too low when compared with the present rate of consumption.

Lead—Advance in lead prices last Tuesday was the sixth since July 8 when the market started its upward climb and brings the total rise to 2.75 cents. Previously there had been eight successive declines, amounting to 9.50 cents, from the record high of 21.50c on Mar. 8. The market is now quoted 14.55c to 14.60c, St. Louis.

Principal sellers limit daily bookings to their intake of raw materials and, since it has been insufficient to cover inquiry fully, they have waiting lists of consumers wishing to purchase on a flat price basis. Bulk of business, however, is still being done on an average price basis.

Substantial orders are being placed by all classes of consumers, especially battery makers who account for about one-third of the annual consumption of lead. Royce G. Martin, president, Electric Auto-Lite Co., Toledo, O., is quoted as saying the battery industry is now experiencing a demand that threatens to outrun production. Estimates of replacement battery production for 1949 are around 17 million units.

Following the advance in primary lead, manufacturers of lead sheets, pipe and oxides revised their prices proportionately.

Stocks of lead held by smelters and refiners as of July 1 totaled 228,002 tons, an increase of 7933 tons over the June 1 total and an increase of nearly 8000 tons over the July 1, 1948, total. Stocks in ore and matte and in process at smelteries rose to 83,840 tons from 81,064 tons on June 1; stocks of refined lead, to 87,703 tons from 83,587 tons; stocks of antimonial lead to 12,414 tons from 10,545 tons. The only decline was in stocks in base bullion at smelteries and refineries which dropped to 22,832 tons (lead content) from 27,174 tons on June 1.

Copper—Available supply of copper is being sold readily, although pressure on the market is absent. The automotive industry continues to account for a substantial tonnage of copper consumed. Copper & Brass Research Association estimates that this industry will consume about 125,000 tons of copper, brass and bronze during 1949. This is based on an anticipated production of more than 6 million cars and trucks for 1949. The average amount of copper and high-copper alloy ranges from 37 pounds to almost 70 pounds per vehicle. According to present information, the 1950 model cars will have about the same copper content.

Inquiry being received from most consumers is for prompt delivery, indicating that inventories are still below desired levels despite the heavier buying which has been done during the past few weeks. Bookings for August delivery already aggregate over 30,000 tons.

In addition to the demand emanating from industrial users, inquiry for copper is also being made by representatives of the government. The trade expects substantial buying for stockpiling with 1949 delivery specified. Funds for these purchases would be drawn from the total cash appropriation of $315 million which has been approved by the Senate Appropriations Committee.

Metal Price Averages For July

(cents per pound)

Electrolytic Copper, del. Conn.	17.279
Lead, St. Louis	13.335
Prime, Western Zinc, E. St. Louis	9.346
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	17.000
Antimony, f.o.b. Laredo, Tex.	38.500
Nickel, f.o.b. refinery	40.000
Silver, New York	71.500

Zinc—Continued active buying of zinc by the galvanizing and die casting industries is sustaining zinc prices on a firm basis. Only small tonnages have been booked for brass mills. Prime western is steady at 10.00c, East St. Louis.

Howard I. Young, president, American Zinc, Lead & Smelting Co., has expressed the hope that the long strike at the company's properties at Fairmont City, Ill., and Metaline Falls, Wash., will be over by the end of the third quarter. He pointed out, however, that the company pulled the fires from its furnaces at Fairmont City and, therefore, production of slab zinc at this plant "will be discontinued for an indefinite period."

Tin—Output of refined lead by the Longhorn smelter in Texas amounted to 2910 tons in July compared with 3006 tons in June and 3509 tons in July, 1948. This brought total output for the first seven months to 21,389 tons compared with 21,949 tons in the like 1948 period.

No progress has been reported in negotiations between this government and Belgium for acquisition of large tonnages of tin concentrates and pig tin for the United States' permanent stockpile. Reconstruction Finance Corp. has purchased only about 2000 tons of pig tin against the second-half allocations of 17,100 tons.

Aluminum—War Assets of the General Services Administration has sold three government-owned aluminum plants to Permanente Metals Corp. at a price of $36 million. The terms provide a down payment of 5 per cent and a purchase money mortgage or mortgages over a period of 25 years at 4 per cent. The plants are: Meade aluminum reduction plant at Spokane, Wash.; Trentwood rolling mill at Spokane; and an alumina plant at Baton Rouge, La.

Zinc-Lead Ore Reserves Rise

Washington—Zinc-lead ore reserves of the Tri-State district are estimated at 66,100,000 tons of minable ore, according to the Bureau of Mines. More than 15 million tons of ore have been added to the reserves since earlier figures were released in 1946.

Of the estimated reserves, Missouri is credited with 27,156,000 tons, Kansas with 25,226,000 tons, and Oklahoma with 13,718,000 tons.

In 1947, the district produced 17 per cent of the nation's zinc and 6 per cent of the nation's lead. In 1948, zinc output dropped to the lowest on record since 1896. This was due in part to high production costs.

Two world wars and a depression have resulted in selective mining of the highest-grade ore. Much low-grade ore has been lost through such selective mining, and a substantial part of the remaining reserves have been reduced to submarginal grades.

About 26,359,700 tons of ore in Kansas and Misouri are under water. Pumping and controlling the water during mining operations is a major cost problem in the district.

A copy of Report of Investigations 4490, "Zinc-Lead Ore Reserves of the Tri-State District, Missouri-Kansas-Oklahoma," may be obtained from the Bureau of Mines, Publications Section, 4800 Forbes St., Pittsburgh 13.

Bridgeport Price Policy

Bridgeport, Conn. — Bridgeport Brass Co. has informed its customers that all future orders will continue to be entered on the basis of "price in effect at time of shipment." This will not affect any orders now on the company's books, however, that were taken some time ago on the basis of a firm price.

Lead Rises in Britain

London—Ministry of Supply advanced lead prices £1 7s 6d effective Aug. 2. The new prices are on the basis of £85 2s 6d for "good soft lead," delivered buyers' works in the United Kingdom.

Canadian Lead Price Up

Montreal—Consolidated Mining & Smelting Co. of Canada advanced its lead price ¼-cent to 14.75c a pound, delivered Montreal, effective Aug. 2. The upward adjustment is the fifth since the low of 11.75c was made last May.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley; Lake, 17.75c., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.25-16.00c; 88-10-2 (No. 215) 24.00c; 80-10-10 (No. 305) 20.50c; No. 1 yellow (No. 405) 12.00-13.75c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.55-14.60c; chemical, 14.65c; corroding, 14.65-14.70c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-16.75c; No. 12 foundry alloy (No. 2 grade) 15.00-15.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 16.75-17.25c; grade 2, 15.50-16.25c; grade 3, 14.50-15.25c; grade 4, 13.50-14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $78-$81 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.42½, l.c.l. 24.05, c.l. 23.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.193, l.c.l. 25.943, c.l. 25.443; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	28.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.75 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.75 per cwt. Traps and Bends: List price plus 53%.

ZINC

Sheets, 14.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.00c; over 12-in., 14.00c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
May Avg.	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
July 1-5	16.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 6-7	17.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 8-9	17.00	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 11	17.62½	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 12	17.62½	13.35	9.00	103.00	17.00	38.50	40.00	71.50
July 13-16	17.62½	13.80-13.85	9.00	103.00	17.00	38.50	40.00	71.50
July 18-23	17.62½	13.80-13.85	9.50	103.00	17.00	38.50	40.00	71.50
July 25-26	17.62½	14.05-14.10	10.00	103.00	17.00	38.50	40.00	71.50
July 27-30	17.62½	14.30-14.35	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 1 ..	17.62½	14.30-14.35	10.00	103.00	17.00	38.00	40.00	71.50
Aug. 2-4.	17.62½	14.55-14.60	10.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb: f.o.b. shipping point, freight allowed: Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red Brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 13.75, No. 2 copper 12.75, light copper 11.75, composition red brass 10.50-10.75; radiators 8.75, heavy yellow brass 8.00-8.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00, No. 2 copper 13.00 light copper 12.00 refinery brass (60% copper) per dry copper content 11.75-12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.00-12.25, No. 2 11.00-11.25, light copper 9.75-10.25, No. 1 composition red brass 8.50-8.75, No. 1 composition turnings 8.25-8.50, mixed brass turnings 5.25-5.50, new brass clippings 9.75-10.25, No. 1 brass rod turnings 7.25-7.50, light brass 5.25-5.50, heavy yellow brass 5.75-6.00, new brass rod ends 7.25-7.50, auto radiators, unsweated 7.00-7.25, cocks and faucets, 7.00-7.25, brass pipe 7.00-7.25.

Lead: Heavy 10.75-11.25, battery plates 6.50-6.75, linotype and stereotype 11.25-11.50, electrotype 10.00-10.50, mixed babbitt 11.25-11.75, solder joints, 13.50-14.00.

Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 9.50-10.00, old sheets 5.50-6.00, crankcase 5.50-6.00, borings and turnings 3.00-3.50, pistons, free of struts, 5.50-6.00.

UNIVERSITY OF MICHIGAN LIBRARIES

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$21.00
No. 2 Heavy Melt.	19.00*
No. 1 Busheling.....	21.00
No. 1 Bundles.....	21.00
No. 2 Bundles.....	17.00-17.50*
No. 3 Bundles.....	16.50-17.00*
Heavy Turnings	16.50-17.00*
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	13.00-13.50
Short Shovel Turnings.	16.00
Cast Iron Borings.....	16.00-17.00
Bar Crops and Plate..	21.50-22.00
Low Phos. Steel.....	23.00-23.50

Cast Iron Grades†

No. 1 Cupola Cast.....	23.00-23.50
No. 1 Machinery Cast.	27.00-28.00
Charging Box Cast....	21.00-21.50
Heavy Breakable Cast.	18.50-19.50
Brake Shoe	21.50-22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.50-22.00
Axles	23.50-24.00
Rails, Random Lengths	23.00-23.50
Rails, 2 ft and under..	26.50-27.00
Rails, 18 in. and under	27.50-28.00
Railroad Specialties ...	23.00-23.50
Angles, Splice Bars....	23.00-23.50

*Nominal.
‡Brokers' buying prices.
†Crushers' buying prices.

CLEVELAND

Heavy Melt. Steel	$15.00-16.50
No. 1 Busheling	15.50-16.50
No. 2 Bundles	13.50-14.50
Machine Shop Turnings	9.50-10.00
Mixed Borings, Turnings	15.00-15.50
Short Shovel Turnings.	15.00-15.50
Cast Iron Borings.....	15.00-15.50
Bar Crops and Plate...	16.50-17.50
Punchings & Plate Scrap	16.50 17.50
Cut Structurals	17.50-18.50

Cast Iron Grades†

No. 1 Cupola	29.00-31.00
Charging Box Cast ...	24.00-25.00
Stove Plate	25.00-26.00
Heavy Breakable Cast.	22.00-23.00
Unstripped Motor Blocks	20.50 21.00
Malleable	24.00-25.00
Brake Shoes	21.00-22.00
Clean Auto Cast	32.00-33.00
No. 1 Wheels	25.00-26.00
Burnt Cast	22.00-23.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00
R.R. Malleable	26.00-27.00
Rail, 3 ft and under ..	29.00-30.00
Rails, Random Lengths	26.00-27.00
Cast Steel	22.50-23.50
Railroad Specialties ...	22.50-23.50
Uncut Tires	24.00
Angles, Splice Bars....	28.00

† Nominal.

VALLEY

Heavy Melt. Steel	$19.50
No. 1 Bundles	19.50
No. 2 Bundles	16.50
Machine Shop Turnings	11.00-11.50
Short Shovel Turnings.	16.00-17.00
Cast Iron Borings	16.00-17.00
Low Phos.	20.50-21.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00

MANSFIELD

Machine Shop Turnings	$11.00-11.50
Short Shovel Turnings.	15.00-15.50

CINCINNATI

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling.....	17.00
No. 1 Bundles.....	18.00
No. 2 Bundles.....	16.00
Machine Shop Turnings	8.00
Mixed Borings, Turnings	8.00
Short Shovel Turnings.	8.00
Cast Iron Borings....	9.00

Cast Iron Grades

No. 1 Cupola Cast....	27.00
Charging Box Cast....	21.00
Heavy Breakable Cast..	20.00
Stove Plate	17.00
Unstripped Motor Blocks	15.00
Brake Shoes	17.00
Clean Auto Cast	27.00
Drop Broken Cast.....	32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
R.R. Malleable	21.00
Rails, Rerolling	23.00
Rails, Random Lengths	21.00
Rails, 18 in. and under	32.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles.....	$14.50-15.00
No. 2 Bundles.....	11.00-11.50
No. 2 Heavy Melt. Steel	11.50-12.00
No. 1 Busheling.....	14.50-15.00
Machine Shop Turnings	8.00-8.50
Mixed Borings, Turnings	8.00-8.50
Short Shovel Turnings.	9.50-10.00
Cast Iron Borings.....	9.50-10.00
Punchings & Plate Scrap	14.50-15.00

Cast Iron Grades

No. 1 Cupola Cast....	21.00-22.00
Heavy Breakable Cast.	17.00-18.00
Clean Auto Cast.....	21.00-22.00

BUFFALO

No. 1 Heavy Melt. Steel	$20.50-21.00
No. 2 Heavy Melt. Steel	17.50-18.00
No. 1 Bundles.....	17.50-18.00
No. 1 Bushelings	17.50-18.00
No. 2 Bundles	15.50-16.00
Machine Shop Turnings	11.50-12.00
Mixed Borings, Turnings	14.50-15.00
Cast Iron Borings	14.50-15.00
Short Shovelings	15.50-16.00
Low Phos.	21.50-22.00

Cast Iron Grades

No. 1 Cupola	26.50-27.00
Mixed Yard	25.00-26.00
Heavy Breakable	23.00-23.50
Malleable	23.00-24.50
Clean Auto Cast	24.00-24.50

Railroad Scrap

Rails 3 ft. and under..	27.00-27.50
Scrap rails	24.00-24.50
Specialties	24.50-25.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$17.00-18.00
No. 2 Heavy Melt. Steel	16.00-17.00
No. 1 Busheling	17.00-18.00
No. 1 Bundles	17.00-18.00
No. 2 Bundles	15.00-16.00
Machine Shop Turnings	11.50-12.00
Short Shovel Turnings.	13.00-13.50
Mixed Borings, Turnings	11.50-12.00
Bar Crop and Plate...	20.00-21.00
Punchings & Plate Scrap	21.00-22.00
Cut Structurals	20.00-21.00
Elec. Furnace Bundles.	18.50
Heavy Turnings	17.00-18.00
No. 1 Chemical Borings	16.00-17.00

Cast Iron Grades

No. 1 Cupola Cast ...	25.00-26.00
No. 1 Machinery Cast	27.00-28.00
Charging Box Cast ...	24.00
Heavy Breakable Cast.	24.00
Unstripped Motor Blocks	20.00
Clean Auto Cast.....	27.00-28.00
No. 1 Wheels	28.00-29.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$13.00-13.50
No. 2 Heavy Melt. Steel	12.00-12.50
No. 1 Busheling.....	12.00-12.50
No. 1 Bundles.....	13.00-13.50
No. 2 Bundles.....	11.00-11.50
No. 3 Bundles.....	nominal
Machine Shop Turnings	4.00-4.50
Mixed Borings, Turnings	4.00-4.50
Short Shovel Turnings.	5.00-6.00
Punchings & Plate Scrap	15.00
Cut Structurals	15.00
Elec. Furnace Bundles.	17.00

Cast Iron Grades

No. 1 Cupola Cast....	20.00-21.00
No. 1 Machinery	21.00 22.00
Charging Box Cast ...	18.00-18.50
Heavy Breakable.....	18.00-18.50
Unstripped Motor Blocks	15.00-16.00
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$9.50
No. 2 Heavy Melt. Steel	8.50-9.00
No. 1 Bundles	9.50
No. 1 Busheling	8.00-8.50
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings.	6.00-6.50
Bar Crops and Plate..	11.00-12.00
Punchings & Plate Scrap	11.00-12.00
Chemical Borings	10.50-11.00

Cast Iron Grades

No. 1 Cupola Cast.....	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast.	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$19.00-20.00
No. 2 Heavy Melt. Steel	17.00-18.00
No. 1 Bundles.....	19.00-20.00
No. 2 Bundles.....	15.00-16.00
No. 3 Bundles.....	12.00-13.00†
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	13.00-14.00
Cast Iron Borings ...	12.00-13.00
Bar Crops and Plate..	19.00-20.00†
Punchings	19.00-20.00†
Elec. Furnace Bundles.	19.00-20.00†
Heavy Turnings	17.00-18.00
Cut Structurals	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast ...	33.00-35.00
Clean Auto Cast	32.00-34.00
No. 1 Wheels	29.00-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00-21.00
Malleable	22.00-23.00†
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under.	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties ..	23.00-24.00
Angles, Splice Bars ..	23.00-24.00

†Nominal

ST. LOUIS

No. 1 Heavy Melt. Steel	$18.00-19.00
No. 2 Heavy Melt. Steel	17.00-18.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings.	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast....	24.00-25.00
Charging Box Cast....	20.00-22.00
Heavy Breakable Cast...	19.00-20.00
Brake Shoes	19.00-20.00
Clean Auto Cast	28.00-29.00
Burnt Cast	20.00-21.00

Railroad Scrap

R. R. Malleable.....	19.00-20.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under.	25.00-26.00
Uncut Tires	18.00-19.00
Angles, Splice Bars....	24.00-25.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Busheling	16.00
No. 2 Bundles	16.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	14.00
Short Shovel Turnings.	15.00
Cast Iron Borings.....	15.00
Bar Crops and Plate..	23.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast ...	28.00
Stove Plate	25.00
No. 1 Wheels	17.00-18.00

STEELMAKING SCRAP COMPOSITE

Aug. 6	$19.34
July 30	19.34
July 1949	19.21
Aug. 1948	43.33
Aug. 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	nominal
Rails, Rerolling	22.50-23.00
Rails, 3 ft. and under.	23.00-24.00
Angles and Splice Bars	22.00-23.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles....	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast....	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings.....	15.00
Nos. 1 & 2 Bundles...	15.00
No. 3 Bundles.....	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	22.00-25.00
Cut Structurals	22.00-25.00
Elec. Furnace Bundles.	25.00

Cast Iron Grades

No. 1 Cupola Cast ...	20.00-23.00
Heavy Breakable Cast.	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	23.00
Clean Auto Cast	25.00
No. 1 Wheels.....	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	18.00
Railroad Malleable	22.00
Rails, Random Lengths	18.00
Angles and Splice Bars	18.00

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No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles...	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	26.00
Electric Furnace Bundles	20.00

Cast Iron Grades

No. 1 Cupola Cast....	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00
Rails, Rerolling	22.50

HAMILTON, ONT.

(Ceiling prices, delivered)

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No. 1 Bundles.....	21.00
Mechanical Bundles....	19.00
Mixed Steel Scrap	17.00
Mixed Borings, Turnings	15.00
Rails, Remelting	21.00
Rails, Rerolling	24.00
Bushelings	15.00
Bushelings, new factory, prep'd	19.00
Bushelings, new factory, unprep'd	14.00
Short Steel Turnings...	15.00

Cast Iron Grades*

Cast	26.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

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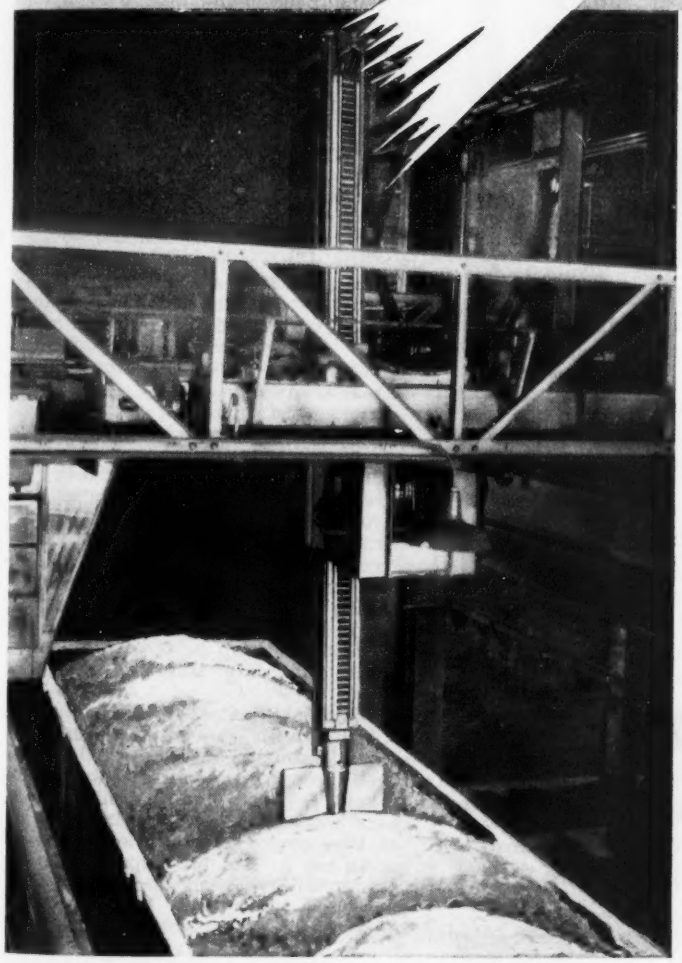

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Sheets, Strip . . .

Demand improves as needs of home appliance makers gain. Prices remain firm

Sheet Prices, Page 110

Pittsburgh—The sheet and strip market is developing a little more life though demand in general is restricted. Automotive tonnage continues to provide major support, with 20-gage cold-rolled sheets difficult to obtain quickly due to heavy automotive commitments.

Some market observers had expected some slackening in activity of motor car builders by this time, but it has not developed. Now they think the slackening will start some time after Labor day. Some of the auto tonnage is being taken as a protective measure in event of a steel strike in September.

From other consuming directions, especially the home appliance field, flat-rolled steel demand is slightly improved. Last week Frigidaire Division, General Motors Corp. at Dayton, O., recalled 750 furloughed workers, making a total of 1000 recalled since mid-July. Tappan Stove Co., Mansfield, O., is stepping up output 10 per cent. Several other developments along this line are serving to encourage expectations of a substantial revival in demand shortly.

While threat of a steel strike next month is considered real, it has not noticeably stimulated protective covering. Such, however, may develop suddenly as the labor situation comes into clearer focus.

Prices are firm at established levels and significant changes in base prices are not likely in the near future. The fact that wages may be increased, however, is not accepted as ruling out the possibility of downward adjustments later in the year, especially should competitive conditions result in a scramble for orders. For the most part, it is believed that if price shading should develop, it will first show up in the waiving of extras. To date this has not occurred.

Philadelphia—Coated sheet supply is tight, with some sellers booked solidly through October. Cold-rolled sheet producers generally are sold through September, although in some cases tonnage is available in the latter two weeks of that month. Hot sheets can be had for shipment within four to five weeks. Demand for enameling stock is a little tighter, reflecting improvement in stove requirements. This grade, however, is still available for September shipment. Stainless flat-rolled products can be had in three to four weeks and, while demand for stainless bars and wire is actually less active than for sheets, deliveries are somewhat less uncertain as producers often have to wait until they can get sufficient tonnage for a rolling. Refrigerator specifications are up slightly, with the Philco Co. here resuming operations last week in this department after a suspension of about one month and a half.

New York—Following a dip last month to a new low for the first

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seven months, sheet specifications are more active. Many consuming plants are operating at a higher rate, having ended their mass vacations. Moreover, some had allowed their inventories to get too low.

At present, most sellers are booked over the remainder of this quarter on practically all grades. However, should the labor situation clarify over the next several weeks, some cutbacks may develop.

Boston—Slightly heavier buying of flat-rolled steel is accompanied by some increase in forward commitments with October schedules filling on cold-rolled and galvanized. More pressure is noted also for delivery by early September which cannot be met in many instances. Delivery dates and freight costs are major buying factors in this mild spurt. With so many intangible matters involved, doubt is rampant as to whether present improvement represents a real trend. Most buyers are convinced lower prices are not likely in the near future. Inventories are lower, vacations are ending and consuming plants are working off steel at a higher rate.

Cleveland — Protective buying against a possible steel strike in mid-September is under way, particularly by the automobile makers. As a result, demand for flat-rolled products continues strong. One producer is booked through September on flat-rolled, except galvanized sheets, and is selective in order taking on which he is booked through October. Overall stringency in galvanized sheet supply is due chiefly to the country's limited galvanizing facilities.

Upturn in activity of appliance makers is bringing increased demand from that sector for flat-rolled.

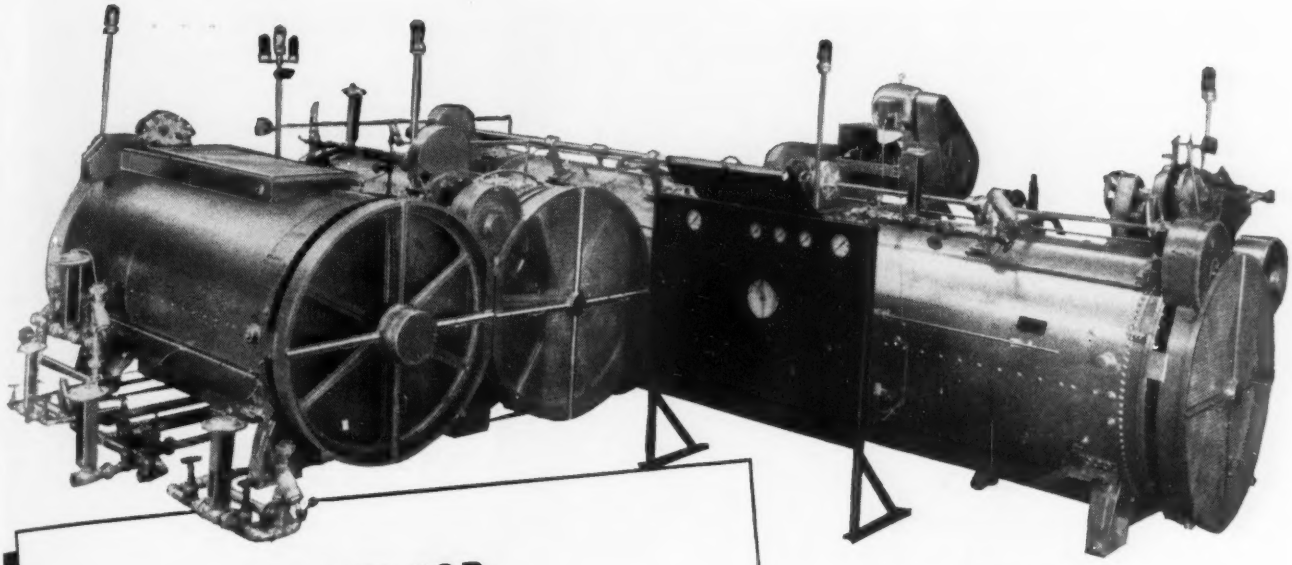
With overall steel demand and production down, consumers have come to believe immediate shipment is possible and, in some instances, are asking for delivery within less time than the products can be rolled.

Chicago—Demand for sheets and strip has strengthened principally from the automotive and electric appliance fields. Factors affecting this development are expanded production schedules, end of vacation shutdowns and a tendency to increase inventories. The latter factor may be a safeguard against possible interruption to steelmaking in the fall.

Kokomo, Ind. — Continental Steel Corp., this city, lowered prices for certain sheet items, effective July 1. Hot-rolled sheets, 18 gage and heavier, are quoted 3.35c; hot-rolled sheets, 19 gage and lighter, 4.25c; No. 10 galvanized sheets, 4.50c; all on Kokomo mill base.

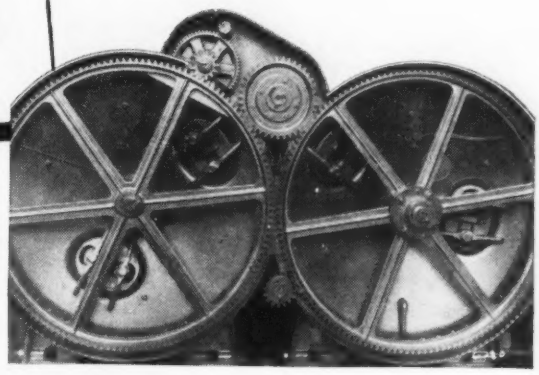
Birmingham—Output of sheets and strip is well sustained and most items are in relatively easier supply, the major exception being galvanized. Considerable of the strip output is in cotton ties. Demand is well maintained.

Dallas—Demand for sheet and strip has eased, though prices have held fairly well despite uncertainty caused by disposal of surpluses. Galvanized sheets continue in comparatively short supply, with demand continuing steady. Mill allocations still prevail in some instances.



Pressure cooker and cooler built by Anderson-Barngrover Division of Food Machinery and Chemical Corporation, San Jose, California.

BUILT FOR *Pressure Cooking* WITH HEAD-SHAPES 3/4" THICK



Lukens Flared, Dished and Flued Head-Shapes were used for the cooker and cooler ends.

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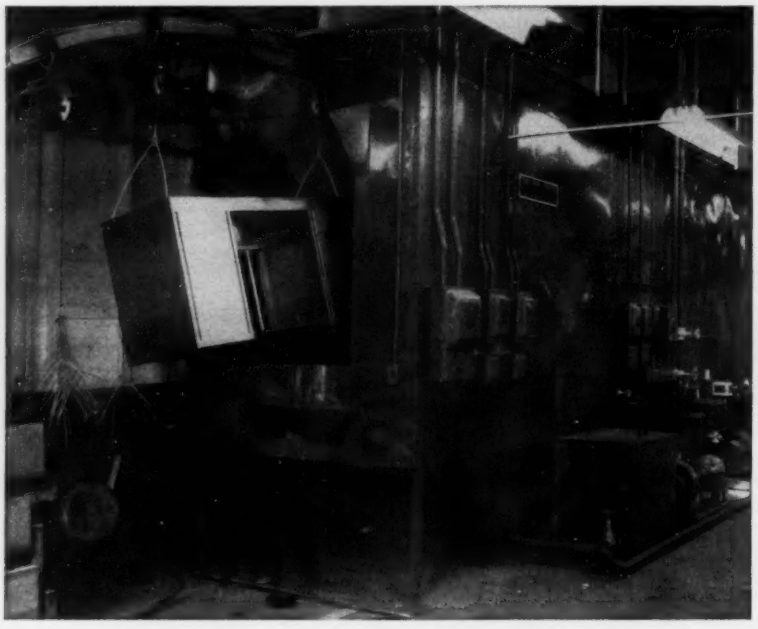

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Steel Bars . . .

Bar Prices, Page 110

Pittsburgh—Slight quickening of consumer interest in hot-rolled bars is reported due chiefly to desire of buyers to replenish inventories and partly to protective covering in anticipation of a strike next month. Resumption of activities at some plants following mass vacations also is a factor for more specifying. On the whole August will prove to be a better month from the standpoint of volume than generally had been expected. Pickup in buying from the appliance people, especially refrigerator builders, has been particularly encouraging. However, demand generally continues slow and bookings into September and October are far from heavy. In cold-finished bars, while the downtrend in demand is thought arrested, the volume of business continues limited.

New York — While hot carbon bar consumers are specifying more freely, a number having completed vacation periods, the outlook is for a continued easing in supply over the next several weeks, especially should automotive requirements taper. If there isn't a steel strike by October, there likely will be cutbacks, as auto makers have been covering in excess of needs because of the possibility of a walkout.

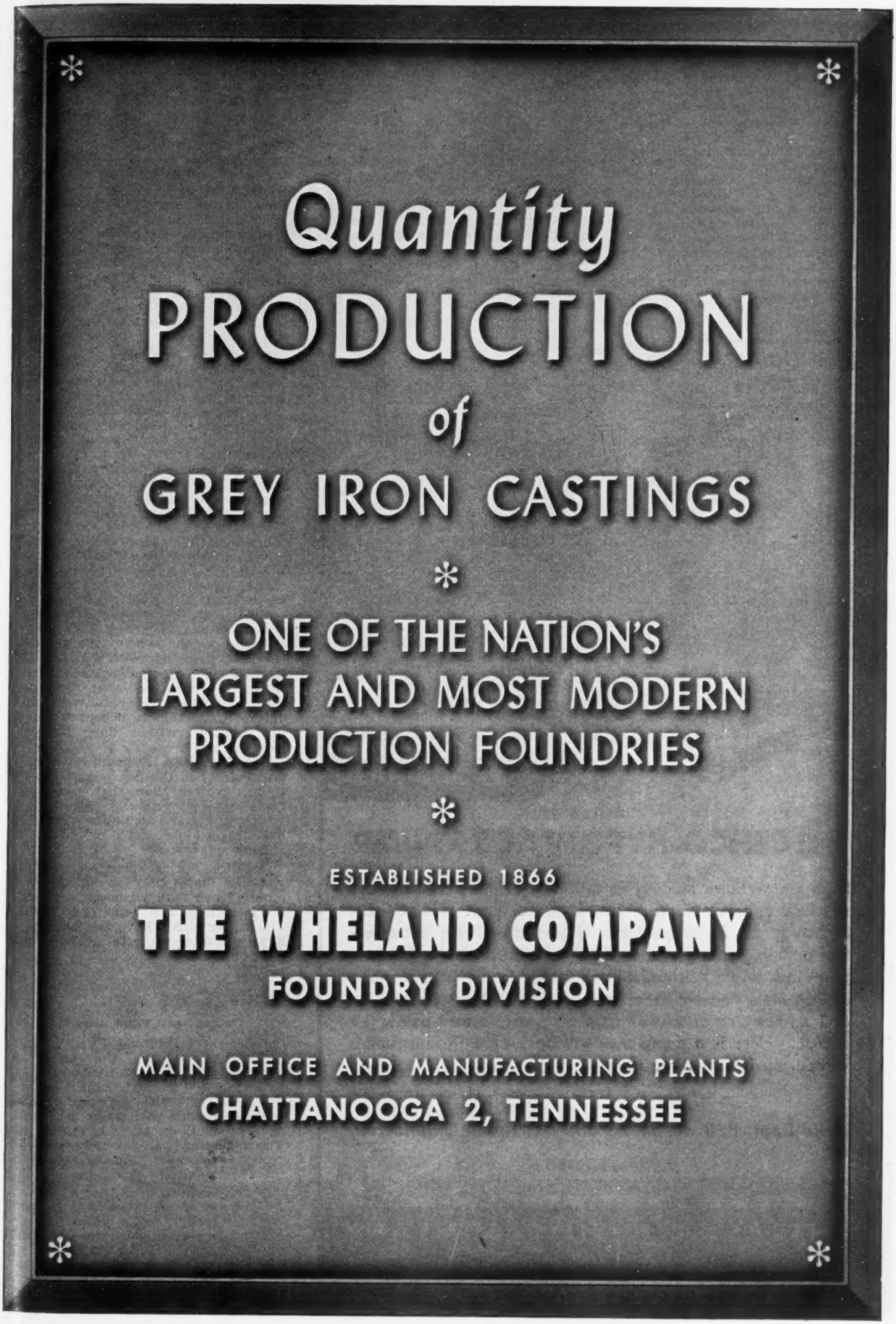
At present, consumers can obtain mill deliveries within three or four weeks on most specifications, even less in some instances. Shipments on cold-drawn carbon bars also can be had fairly soon, often from stocks.

Boston—A mild pickup in buying of carbon steel bars including hot-rolled, finds some mills in Septembr on deliveries, while others can still fill certain specifications this month. A considerable portion of bar mill capacity is down, notably cold-rolled and the smaller units on hot-rolled. Forward orders are slightly heavier with scattered commitments for October. Overall demand for both carbon and alloy bars, however, is slow with most consuming industries operating at lower levels.

Philadelphia — Hot carbon bars, along with plates, are moving perhaps the most sluggishly of all major products in this district. Deliveries on practically all specifications can be had fairly promptly, usually in three to four weeks and in some instances sooner, depending upon rolling schedules. Cold carbon bars likewise are in easy supply, with mills having substantial stocks of the more popular sizes on which to draw. Alloy bars continue to lag.

Cleveland—Automotive and farm implement makers are currently the chief takers of hot-rolled bars. There is sufficient supply available to provide fairly early delivery to these as well as other customers. However, producers continue selective in order-taking.

Chicago — Barmakers increased their bookings last week, but demand is still spotty. Forgers serving the automotive and tractor industries have heavier commitments, while those supplying the farm implement and railroad fields continue to operate at a slack rate. Farmers are confining purchases to immediate needs and railroad car building is close to a standstill.



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Plates . . .

Plate Prices, Page 111

Philadelphia—While feeling the lag in ship and railroad requirements, district plate makers describe miscellaneous business as "a little better than it was." Fuel oil storage and heater tonnage is picking up a bit, as plans get under way for installations before cold weather sets in. Special work for utilities is still going ahead in fair volume and electrical equipment manufacturers are showing somewhat more interest, with some reporting inventories as getting out of balance. However, most plate makers can still book tonnage for shipment this month, despite limited operations.

With possibly one exception, eastern producers are rolling on schedules ranging from two to four days a week, with ingot operations substantially curtailed.

Demand for floor plate is slow, with most distributors having good stocks.

An eastern plate washer manufacturer, in additon to quoting $1 off list, is now allowing 50 cents freight absorption, as a further concession.

New York—Plate consumers have little difficulty in obtaining nearby shipments. Except from one eastern mill, which is booked up solidly throughout the remainder of the quarter on sheared plates, buyers claim they can obtain shipments within three to four weeks, and upon certain occasions even less. Tank and boiler makers continue to specify lightly; also carbuilders and railroad shops, as orders for rolling stock remain at low ebb. Carriers are specifying some maintenance tonnage. Shipyard demand is spotty and principally for repairs, although there may be some requirements in the near future for three Staten Island ferry boats for this cty. Bids were opened recently on these boats for the second time.

Birmingham—No actual surplus of plates is apparent here, although supplies are considerably easier. Heavier gages are in better supply than the lighter variety. Since carbuilding and ship repair work has slackened considerably, many miscellaneous users are being better supplied than previously.

Boston — While some universal plates are available for September shipment, sheared mill schedules are filled for that month in some instances; order backlogs with others are meager and delivery can be made before that period—in a matter of days by truck on some widths and gages. Plate backlogs vary widely with producers, depending on delivery, freight and service factors. Competition and lower prices for fabricated tank shop work is forcing buyers to shop for plates with cost sheets in hand. Those building small tanks, 1000 to 3000-gallon capacity, are booking a fair volume.

Pittsburgh — Small-lot plate tonnage is being booked a little more actively on the whole, the market continues sluggish with the immediate future outlook obscured by uncertainties over the labor situation. Future bookings are light with producers in position to accept tonnage for shipment within three to four weeks.

San Francisco—Demand for plates, particularly in the heavy gages, continues greater than that for other types of steel products. Supplies of lighter gages are ample for all needs, but there appears to be no overstock.

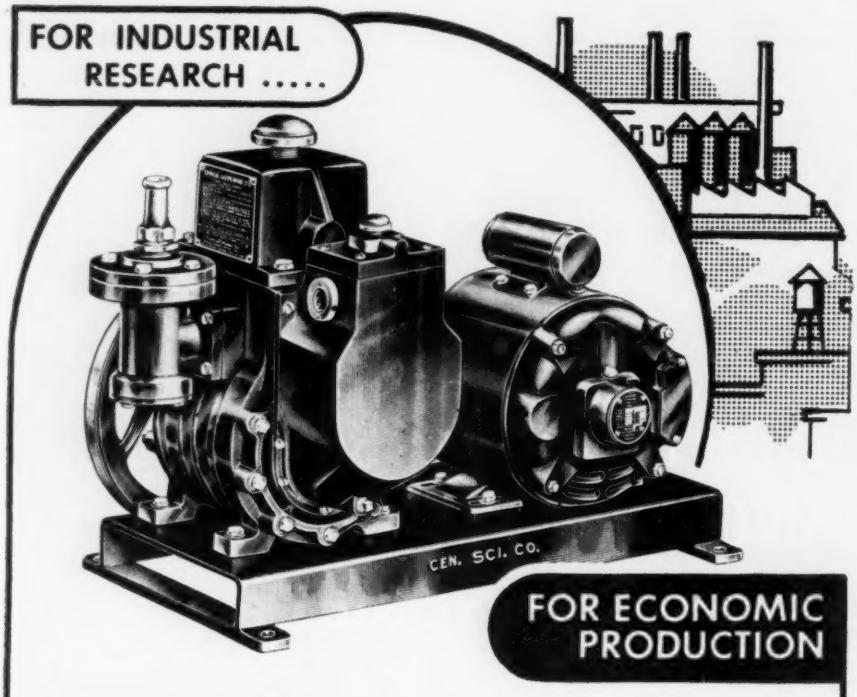
Seattle—The smaller shops fabricating plates are on a hand-to-mouth basis with business slow. Order backlogs are practically gone. The larger plants have fair backlogs. Several sizable projects are to be up for figures soon.

Rails, Cars . . .

Track Material Prices, Page 111

Denver — Colorado Fuel & Iron Corp. has reduced the price of standard rails $2 a ton to the basis of $3.20 per 100 lb, f.o.b .mill. This reduction brings the company's price for rails in line with other sellers of such products on an f.o.b. mill basis. The reduction was taken because of reduced volume of business and to meet competitive conditions.

New York—Indications are that freight car awards last month were among the lightest in years. Possibly the largest single order was that of the Solvay Process Co., involving 100 aluminum tank cars. Indications for this month are for little, if any, improvement, as no important inquiries are pending.



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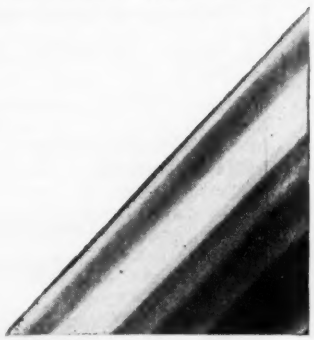

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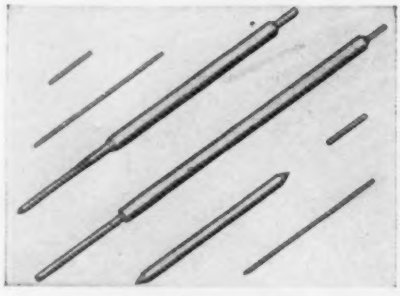

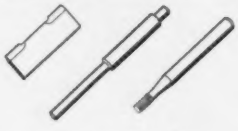

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Tin Plate . . .

Tin Plate Prices, Page 111

Pittsburgh—Fair volume of bookings for September shipment is reported by tin plate sellers. In a few instances consumers are asking that orders now on books be expedited as quickly as possible, this attributed to a desire to get in as much tonnage as possible for inventory insurance against a possible steel strike next month. In general, tin plate buyers are specifying according to schedule. Beyond September, the outlook for business is not clear. Once the labor situation is clarified, sellers are confident substantial specifying will be done, though demand is expected to be off somewhat seasonally. The question of prices is pertinent in conection with fourth quarter volume. It is pointed out that in event an advance in wages is granted next month, and this in turn results in a possible increase in 1950 tin plate prices, then there is likely to be quite heavy ordering during the closing months of the year. There is nothing in the picture at the moment, however, to indicate that higher prices are on the way.

Tubular Goods . . .

Tubular Goods Prices, Page 111

Boston — Seamless pipe schedules for September are well filled, but demand for other tubular products is slow. Mechanical tubing and boiler tube deliveries have improved substantially and are now available in three to five weeks on more sizes. Demand for boiler tubes has been reduced by dieselization of railroads in this area.

Natural gas will reach New England ahead of expectations, probably by 1951, either by tapping the Big Inch line from Pennsylvania or via Buffalo. Utilities are anticipating the accompanying steel pipe requirements for laterals and replacement of some iron mains. There is also an unseasonal spurt in buying of cast iron pipe, involving close to 3500 tons.

Cleveland — Pipe production by one company continues at 100 per cent of capacity and because of strength of demand this producer is keeping quotas in effect, September quotas now being drawn up. Even with quotas the producer has about a three-weeks carryover on pipe.

While a few jobbers are passing up part of their quotas on standard pipe, other jobbers stand ready to take up any slack. Even though large diameter line pipe is booked through 1950, very few cancellations have been received. Meanwhile, additional projects are bringing forth additional orders.

However, a softening in demand for oil well casing is anticipated for the fourth quarter of this year.

Salt Lake City—Mountain Fuel Supply Co. plans completion of its 31-mile natural gas transmission line from Coalville, Utah, to Salt Lake City by Sept. 15. The line, constructed of 20-inch pipe, will cost $1,750,000.

Los Angeles—Buying of pipe and equipment by petroleum producers continues fairly stable, with careful attention being devoted to budgets

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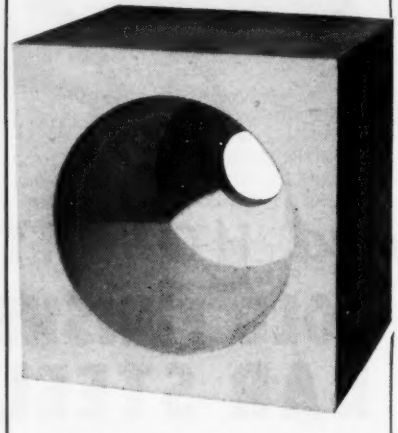

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and prices. One major oil company has announced a $2,250,000 refinery expansion program, under which it will install equipment enabling the plant to turn out less of the heavy fuel oil for which demand is slack, and more of the gasoline and other light products for which demand is strong. Similar moves by other refineries could set off considerable buying of equipment. Foreign inquiries for oil drilling rigs and storage facilities have picked up noticeably, stimulated by availability of ECA funds.

San Francisco—Pipe demand from utilities, oil companies and natural gas transmission concerns continues active. Some increase in home and industrial construction is firming orders for small diameter tubular items.

Seattle—Interest in cast iron pipe is lacking and agencies are not optimistic. Practically all bid calls include alternatives. The largest project pending, 300 tons for Kirkland, Wash., will be placed soon.

Structural Shapes . . .

Structural Shape Prices, Page 111

Boston—As competition for fabricated structural work grows, mills with a $4 to $5 freight disadvantage on plain material are having increasing difficulty in placing business. Quotations on fabricated steel are about 50 per cent below peak levels. Deliveries of plain material are available within three to four weeks and are available on more sizes from stock. Shops also can make better deliveries, the larger units quoting three months compared with six months late last year. New tonnage up for estimates is light and only a few contracts are being let, but include 1500 tons for a power plant expansion.

New York—A fair scattering of structural work is reported, chiefly of public character. In general, projects are small. An exception in the East is state bridge at Yorktown, Va., requiring 10,413 tons of shapes, 1453 tons of reinforcing steel and 230 tons of piling. The current trend is upward, although competition is increasingly keen and backlogs are still shrinking. Most fabricators report shape deliveries from their suppliers as satisfactory.

Pittsburgh—Slight pickup in structural shape demand is noted, but demand overall continues to lag. Buyers' expectations of early price reductions are fading since labor conditions make a downward adjustment in price schedules unlikely. Fabricators' backlogs are declining steadily.

Philadelphia — Little structural business was placed in this district last week, although a fair amount of the tonnage is active, chiefly public work. Competition among fabricators is still keen, as backlogs continue to shrink.

Dallas—All structurals are in good supply despite heavy construction demands. Competitive conditions and scattered offerings of surpluses have resulted in some price shaving though warehouses and mills have maintained steady prices.

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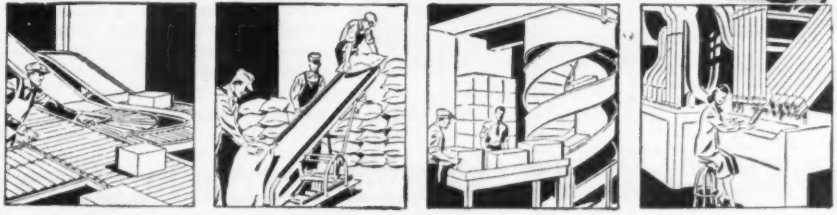

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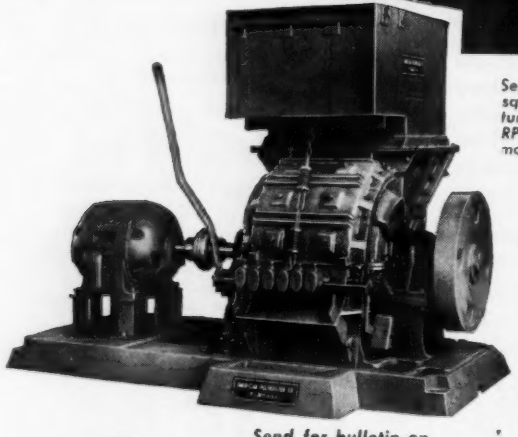

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tural shapes may increase soon as a result of a pick-up in private industrial construction now being started or planned by a number of West Coast firms. Meantime, principal construction work is centered on public works. Inventories of most structural goods are large.

Seattle—Normal operations are reported by fabricating plants, with a sizable tonnage involved in small jobs of less than 100 tons each.

Wire . . .

Wire Prices, Page 111

Cleveland — A modest upturn in demand for manufacturers' wire is noted by one producer, but whether this is a genuine recovery in business activity or largely protective buying against a steelworkers' strike has not been ascertained. Some of the upturn comes from the furniture and bedding industries, which were among the first to feel the business recession.

Fairly early delivery can still be had on most manufacturers wire. One producer is sold out through August on most such products.

Crawfordsville, Ind. — Mid-States Steel & Wire Co. is quoting low-carbon manufacturers' wire 4.15c per pound; merchant quality wire, 6 to 8 gage, 4.80c annealed and 5.25c galvanized; woven fence, 9 to 15½ gage, column 109; single loop bale ties, column 106; stock nails and staples, Column 103. The company is equalizing freight from its Crawfordsville, Ind., mill with other producing points.

Birmingham—Supply of wire and wire products, including nails, has improved. A spurt in wire sales, especially of nails, developed last week following a lag in the preceding two weeks.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 110

Dallas—Activity in industrial and public works requiring reinforcing bars is providing best outlet for bar material. Demand has held up consistently and continues to do so. Fabricators continue active operations and all sellers report sustained market activity.

Los Angeles—Requirements remain light and, with the exception of one or two items, structurals daily become more competitive. However, demand is benefitting from new instruction of broadcasting towers for television stations. Among the industrial projects is a $25 million soap and food products plant to be built here by Lever Bros. Co. Despite reduced production of structurals, surplus inventories held by fabricators and distributors are substantial and continue to be offered at shaded prices.

Seattle—Rolling mills still have substantial backlogs. Operations are at capacity except for one electric furnace plant in Seattle which is still idled by a labor dispute. Demand for small reinforcing tonnages is insistent, although public works absorb the bulk of mill output. Sizable tonnages are pending for Washington state highway work.

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Pig Iron . . .

Pig Iron Prices, Page 112

New York—Pig iron demand is expected to improve over the balance of this year. Contributing to the nearby improvement, foundries are steadily reopening after vacation shutdowns, are buying to replenish stocks, are planning to stepup operations as cooler weather develops, and are expecting to receive larger castings orders.

However, production of pig iron likely will decline during the next two months, since producers generally have more than enough supplies in sight (stocks and new output) to meet requirements. Despite further curtailments in output, producers are still piling iron.

Imports of pig iron are negligible, dropping below the April rate of 2221 tons which compared with a monthly average of 20,500 tons for the first quarter. Exports totaled 27,460 tons in the first four months, including part of the 40,000-ton order placed last spring with the Lone Star Steel Co. of Texas for shipment to Great Britain.

Boston — Pig iron releases this month are slightly heavier, chiefly from the smaller shops, while steelworks are resuming operations following vacations. The latter are not buying basic pig iron in volume while reducing inventories. Demand for castings shows only a slight improvement and inventories of finished castings remain substantial.

Mystic furnace, while piling iron, may continue operations through this month before banking. Estimates of the stockpile at this furnace at Everett, Mass.. indicate it is too large, but stack probably will go down with considerably less tonnage in reserve than has been the case several times previously.

Pittsburgh—Some new foundry demand for pig iron is developing, but it is restricted to relatively small tonnages. A few manufacturers of specialties are enlarging production schedules with mass vacations out of the way, making necessary the covering of raw material requirements. In general, the market is lifeless with consumer inventories substantial, running from 30 to 60 days in many instances. Surprisingly, threat of a steel strike next month has not stimulated protective covering to any noticeable extent, another reflection of the heavy inventory position of consumers. Test of the going market awaits revival of active buying with quoted prices unchanged. Blast furnace operators are conserving coke as much as possible, concentrating production in those stacks which permit most economical use of fuel.

Buffalo — Although pig iron output dropped further last week, a better undertone was noted in the foundry trade. Bethlehem withdrew one of its six stacks, due mainly to the low price of scrap. The unit was on basic iron. Foundries are taking larger tonnages and some have advanced delivery dates. This is just the opposite to the condition prevailing a short time ago. Foundries also are obtaining a few more requests from casters to "figure" on

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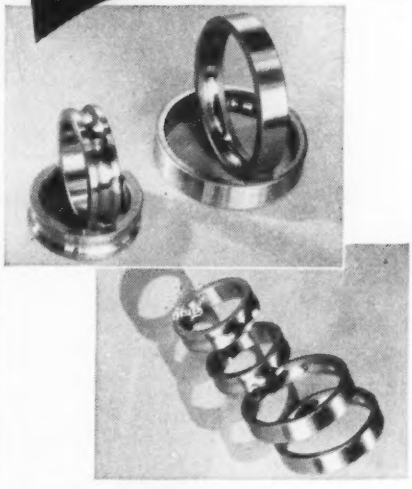

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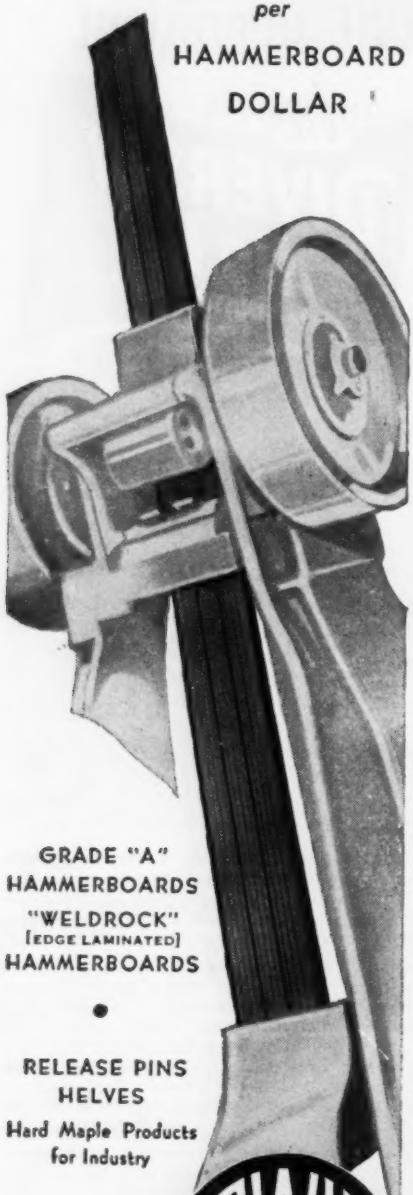

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certain job requirements. The change in trend has buoyed trade spirit to some extent. An extensive rehabilitation job on American Radiator's furnace is about completed. The unit will be relighted as soon as inventory stocks are reduced. Stocks have been cut considerably from the original amount.

Philadelphia — Foundry requirements for pig iron are slightly improved. Not only are more foundries in operation than in July when vacation time reached its peak, but some report improved volume of business. Pipe and radiator business is beginning to stir a bit after a long period of sluggishness. The outlook in these lines over the next couple of months is regarded as more promising. Meanwhile, pig iron producers continue to pile iron.

Cleveland — Demand for merchant pig iron strengthened somewhat last week. New orders were small, indicating buying was to cover current needs rather than as protection against a possible steelworkers' strike in September. Producers have built up stockpiles of iron and can give immediate delivery. Although there was no great upsurge in buying, there was an increase in optimism in the trade.

Cincinnati—Shipment of pig iron into this district is no heavier. A few foundries are extending their vacation shutdowns, and most of the others are on light schedules. In some instances the melters have produced castings for stock in anticipation of demand which has not reappeared as quickly as expected.

Chicago — Iron supply exceeds foundry demand, producers stockpiling excess over shipments. Although foundry operations have picked up moderately, iron inventories are ample to satisfy these requirements. Threat of a steel strike a month ago had stimulated buying for stock building, but this activity dwindled when the strike was averted. There is no indication as yet that this trend will be reversed as the date for the wage fact-finding report approaches.

Birmingham—The district is short two stacks as Tennessee Coal, Iron & Railroad Co. and Republic Steel Corp. repair and modernize blast furnaces at Ensley and Thomas. Even with the gradual improvement in demand noted over the past several weeks, there is no rush about getting Republic's merchant furnace back.

Iron Ore . . .

Iron Ore Prices, Page 112

Cleveland—Shipments of Lake Superior iron ore from upper lake ports in July totaled 12,767,718 tons, an increase of 946,699 tons or 8.01 per cent over the total for July, 1948, according to the Lake Superior Iron Ore Association, this city. June shipments amounted to 12,162,323 tons. Total for the first seven months came to 45,953,288 tons, an increase of 3,118,373 tons, or 7.28 per cent over the like 1948 period. Shipments from United States ports alone totaled 12,459,859 tons in July and 45,211,006 tons for the first seven months compared with 11,722,203 tons and 42,365,468 tons, respectively, for the like periods a year ago.

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Scrap . . .

Stronger price sentiment develops as buying gains in some districts

Scrap Prices, Page 116

Pittsburgh — Noticeable improvement in sentiment among dealers and holders of scrap developed here last week. The market was definitely stronger at the close due to bullish dealers who ask $22 for No. 1 heavy melting. Buying continues sluggish with the major mills still holding substantial inventories and apparently not disposed to enter the market on a large scale until these have been pretty well cleared away.

Heavy purchase of No. 1 heavy melting a week ago by a local mill at $21, said to have been divided among 15 sellers and involving around 35,000 tons, has served to generate a flurry of covering on the part of brokers who are finding it increasingly difficult to obtain metal at that price.

Some holders of metal are asking $22, convinced that the bottom of the decline has been reached and that the trend is now upward. This may be wishful thinking, but it at least reflects the stronger frame of mind of scrap holders who apparently feel it more advantageous to lay down metal in their yards than move it at the current $21 price.

Until the situation is definitely clearer, it is impossible to accurately appraise the stronger sentiment among dealers. In fact, it seems unjustified by the continued dullness in the market. No sign has come from the mills that a large buying movement is about to start and that the pressure on the price structure is off. In fact, some unconfirmed reports were circulating here last week to the effect small sales of No. 1 had been made at Pittsburgh and Youngstown at $20. At the same time, it was reported a Pittsburgh mill that has been seeking tonnage at that figure has been unable to interest sellers. For the most part it would seem that whatever strength has developed here stems largely from the fact a somewhat firmer market tone has developed at other consuming points over the past two weeks or so.

A little foundry buying of cast grades has followed resumption of operations by plants that had been closed for vacations. Purchases, it is understood, were made on the basis of current prices, with No. 1 cupola $22-$23 and No. 1 machinery cast $27-$28.

Philadelphia—A better undertone prevails in scrap, especially cast scrap, on which prices are generally higher. Steel scrap is showing more strength, although prices are fairly steady. Mills are buying sparingly and will probably continue this policy at least until after the wage controversy is settled. Should it be settled peacefully, a spurt in buying may develop. Many sellers regard the outlook as slightly more encouraging and are less disposed to sell at current low levels. Thus, there is now some seller resistance, as well as buyer resistance.

No. 1 steel is now holding at $17-

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$18, delivered, based on small scattered sales. No. 2 steel is $16-$17; No. 1 busheling and No. 1 bundles, $17-$18. No. 2 bundles range from $15-$16. Heavy turnings are holding nominally at $17-$18.

No. 1 cupola is higher at $25-$26; No. 1 machinery cast, $27-$28; charging box and heavy breakable, $24; unstripped motor blocks, $20; clean auto cast, $27-$28; and No. 1 wheels, $28-$29.

New York—While no further price change is reported in steel scrap grades, sentiment is definitely stronger and, in cast grades, brokers have advanced buying prices. They are now offering $20-$21, f.o.b. New York shipping point, on No. 1 cupola cast; $21-$22, No. 1 machinery cast; $18-$18.50 on charging box and heavy breakable cast; $15-$16 on unstripped motor blocks. Cut structurals, nominal for some time past, are now being bought by brokers at around $15.

Consumer demand reflects better buying in cast grades, although little activity in steel scrap. Barge shipments to Lackawanna have slowed up.

Indicating a better feeling in scrap, the Baltimore & Ohio list this month brought generally higher prices than a month ago. Some of the steel grades brought an increase of at least $2.

Buffalo — Stronger tendencies dominated all branches of the scrap market last week. The three leading mills purchased steelmaking grades, aggregating about 7500 tons, at prices representing a 50-cent advance. The widespread interest in new buying bolstered dealers' sentiment.

Prices on No. 2 heavy melting and related items moved up to a range of $17.50-18. The orders also included No. 2 bundles which were placed at the outside figure of the $15.50-$16 range.

Pronounced strength ruled in cast grades. Sales were reported early within the range of $25-$26. Dealers had difficulty in covering commitments and prices hardened with $27 business being refused later in the week. The market was quoted nominally around the rejection price.

Cleveland — Open-hearth and blast furnace scrap grades rose 50 cents to $1 while foundry grades were up $1 a ton here last week. Most of the strength stemmed from buying by foundries, but accounting for only small tonnages. Little buying is necessary on the part of steel mills, for they are still amply stocked. Although only a small volume of scrap si being sold, there is an increasing amount of optimism in the trade. However, dealers still are not sure scrap prices may not drop below the recent low levels.

Cincinnati—Despite lack of tonnage buying in open-hearth grades the iron and steel scrap market is showing an underlying strength which was missing early in the summer. More buying and more inquiries on foundry grades have sent prices an average of $2 a ton higher on heavy breakable cast, stove plate, brake shoes, malleable and short rails. Dealers are showing resistance to present prices, with hint of augmented yard stocks in a speculative move.

Chicago — Activity in scrap continues to be confined largely to broker buying and at prices several dollars a ton over current consumer buying prices. Major mills remain out of the market except for limited tonnages of earmarked customer scrap. Dealers offerings go untouched. At the same time, brokers show little inclination to push sales at present levels. Consumer-wise, developments are confined to turnings and borings and cast grades, all of which have advanced from $1 to $5 a ton.

Birmingham — Scrap prices are firmer, especially in cast grades. Due to slow buying, only a few advances were posted last week. No. 2 bundles are $16, up $2, while stove plate rose $5 to $25.

Los Angeles — Although steel production rates are firming, mills are attempting to reduce scrap stockpiles and are restricting purchases. Two major producers are scheduled to receive additional off-shore shipments. Foundry activity is at lowest ebb in the past year, with estimates of their operations ranging between 25 and 40 per cent of capacity. No changes in scrap prices have been announced here, although the undertone is soft.

San Francisco—Only small amounts of domestic scrap are moving to the mills, which are buying selectively for replenishment of their big stockpiles.

Seattle—Conditions in the scrap market are generally satisfactory, although dealers complain the present level of $17 per gross ton for No. 1 and No. 2 heavy melting eliminates profits. Mills are receiving as much steel scrap as they wish. Inventories are static. Bethlehem Pacific Coast Steel Corp. has unloaded a full cargo of 9000 tons of good-grade well-prepared material from Japan. No further shipments from that area are scheduled immediately.

Warehouse . . .

Warehouse Prices, Page 113

New York—Jobbers report better demand this month, the improvement affecting most major grades of steel. Demand for pipe has shown a particular increase, although resale prices remain unsettled. This situation in prices is believed due to desire of jobbers to turn over their stocks as fast as possible now that most of them have to buy the tonnage outright. Until Apr. 1 of this year, practically 90 per cent of the jobbers were given tonnage on consignment.

Recent improvement in manufacturers' wire business is being sustained. While there is some question as to whether or not protective covering against a possible steel strike next month is an important factor in current activity, the general consensus is that it is not. The answer largely is that inventories have been allowed to get too low, plus better end-use buying.

Pittsburgh—Local jobbers are doing a substantial volume of business but demand lacks zip. Consumers are ordering only for immediate requirements in most instances. Mass vacations at manufacturing plants

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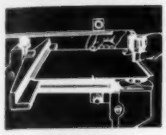
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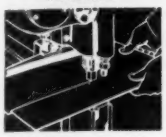
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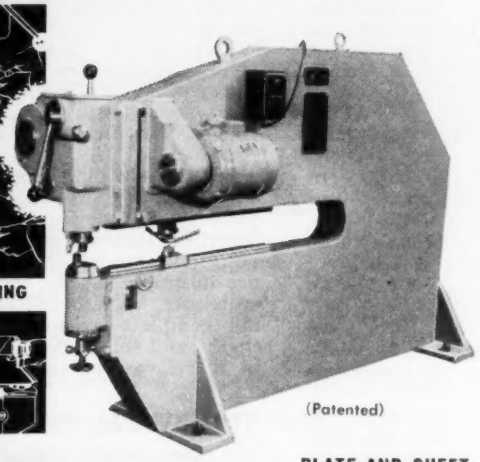
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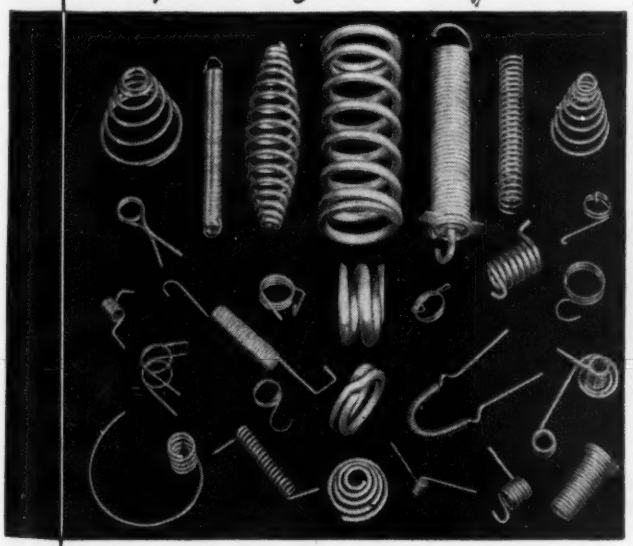

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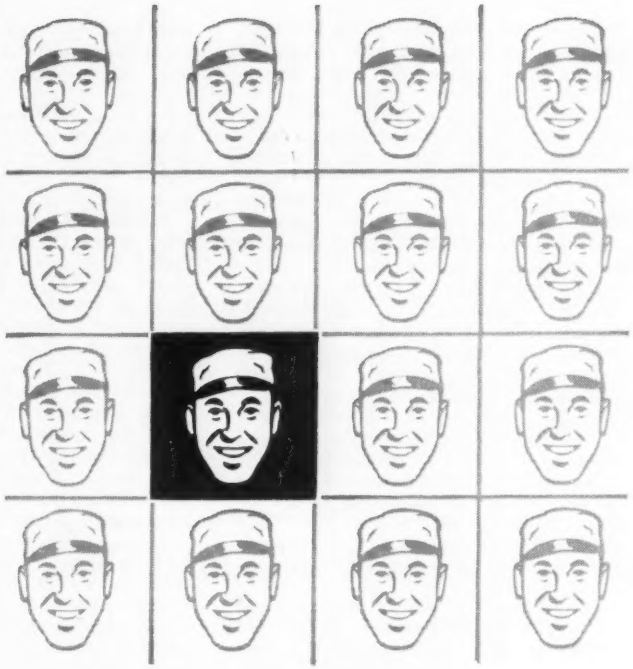

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continue an important factor restricting demand and will continue so until after Labor Day. The flurry of protective buying which was experienced just prior to July 16 when a steel strike was threatened has not been duplicated, although a strike in mid-September cannot be written off. Jobbers feel if more protective buying develops it will be delayed until the last minute. Currently, jobbers' stocks are in the best shape they have been in a number of years.

Boston—Under f.o.b. mill selling, markets have narrowed for individual warehouses. To meet competition in nearby industrial centers, prices are frequently adjusted to meet quotations in those areas. Some sellers are absorbing part of the freight charges in addition to shading prices under these circumstances. This makes for a mixed price structure and confusion. Demand is slow, but has improved slightly. Distributors are not placing the normal volume of forward business with mills. Deliveries on most products are prompt and commitments with mills are closely in line with outgoing tonnage.

Philadelphia—While jobbers anticipate a slightly better month in August, they look for a general lag until at least early fall. Various consuming plants are taking time off for vacations, although not as many as in July, and there is a general disposition among buyers at this time to order lightly.

Cleveland — Warehouse business shows no improvement. Consumers are price conscious and have been showing an increasing interest in secondary material. To avoid necessity of dumping surplus stocks at distress prices, some warehouses have been exchanging steel with one another. Prices as a whole remain steady, except galvanized sheets which have fluctuated in response to a changing price of zinc.

Cincinnati—Demand for warehouse steel hovers close to July levels. There has been improved buying in spots, adding to belief a modest upturn is imminent as inventories become exhausted and seasonal needs appear. Most items are in adequate supply, with galvanized sheets an outstanding exception.

Birmingham — Warehouse steel supplies continue to gain moderately with bookings holding up exceptionally well. August shipments likely will exceed those of July which, in turn, were larger than those in June.

Dallas—Warehouse inventories are not in balance, though the situation has improved. Most surpluses are being pared down and there are some shortages, the latter attributed mainly to better than average economic conditions in this section. Heavy demands generally have prevented accumulation of adequate supplies in some categories. There have been some instances of price trimming, but this is not an established trend.

Los Angeles — Jobber activity has stabilized. Small manufacturers are back in the market on an increasing scale, but are shopping around, seeking surplus at price concessions. Warehouse supplies generally are adequate in all categories, with the single exception of light gage galvanized.

San Francisco—The long-drawn-out strike of the warehouse union here is keeping about half the steel jobbing houses closed. Slack demand, however, has prevented a rush to the warehouses remaining open and virtually no pick-up in buying is reported.

Seattle—Jobbing house executives anticipate no drastic drop in steel prices. Turnover continues active despite a letdown in the lumber and pulp industries. Reinforcing bars are in ample supply, plates, pipe and nails are easier. Stocks generally are complete except for galvanized sheets and this deficiency is expected to be relieved by the fourth quarter.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2550 tons, power house, Public Service Co. of Northern Illinois, Waukegan, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

700 tons, Oregon state bridge, Willamette river, to Poole, McGonigle & Dick, Portland; Tom Lillebo, Reedsport, Oreg., general contractor.

630 tons, state bridge work, Westchester county, New York, to Harris Structural Steel Co., New York.

430 tons, Wyckoff Heights Hospital, New York, to Grand Iron Works, that city.

400 tons, building extensions, Electro-Motive Division, General Motors Corp., LaGrange, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

300 tons, bridge FAGM-UG-18(10)ON, Mitchell, S. Dak., for state, to Iowa Steel & Iron Works, Cedar Rapids, Iowa.

278 tons, Tenth Street bridge, Indianapolis, to Central States Bridge & Structural Co., Indianapolis.

275 tons, building, Newton, N. J., through Walter Kidde, to Albert Smith Sons, Irvington, N. J.

250 tons, warehouse, American Optical Co., Southbridge, Mass., to Fabricated Steel Products Co., Boston; bids direct on steel.

137 tons, bridge S129(2), Clay county, Iowa, to Pittsburg-Des Moines Steel Co., Des Moines, Iowa.

135 tons, milk depot, Maspeth, Long Island, to Simon Holland & Son, Inc., Brooklyn, N. Y.

130 tons, building, Italian Old Peoples Home, Melrose Park, Ill., to Mississippi Valley Structural Steel Co., Decatur Ill.

120 tons, garage, Flushing, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh.

113 tons, bridge (1)TO171, Dunn county, Wis., to Worden-Allen Co., Milwaukee.

100 tons, diesel overhaul shop for Great Northern Railway, Seattle, To Pacific Car & Foundry Co., Seattle.

60 tons, state bridges, Renssalear and Saratoga counties, New York, to American Bridge Co., Pittsburgh.

40 tons, factory building, Benjamin Moore & Co., Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

Unstated, steel for electric circuits, Coulee power plant, to Muskogee Iron Works, Dallas, low $80,312.

STRUCTURAL STEEL PENDING

10,413 tons, state bridge project, Yorktown, Va.; bids Sept. 1.

1500 tons, bridge work for Pennsylvania State Turnpike Commission Inc. in Cumberland and York counties; bids Aug. 10.

400 tons, state bridge work over Erie Railroad, Hawthorne, N. J.; bids closed Aug. 4.

365 tons, field house, Bethlehem, Pa.; Ingalls Iron Works, Birmingham, Ala., low bidder.

300 tons, state highway bridge work, Perry, Juniata and Snyder counties; bids closed.

200 tons, S & S Soap Co. factory, East 135th

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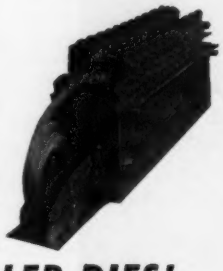

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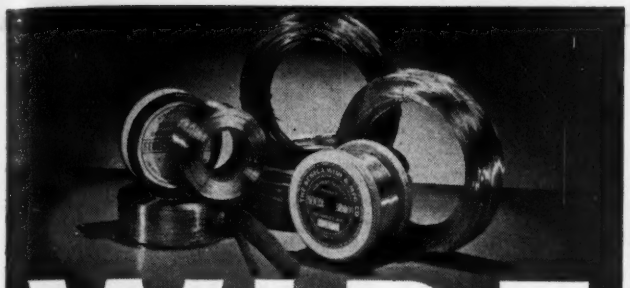

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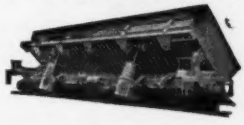

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street, New York; bids asked.

180 tons, state bridge, Rumford, Me.; bids Aug. 10, Augusta.

100 tons or more, Winchester Memorial Hospital, Winchester, Va.; bids Sept. 2.

Unstated tonnage, 6-story addition, Beth-El Hospital, Brooklyn, N. Y.; bids Aug. 15.

Unstated two stop log derricks, McNary Dam navigation locks; Washington Iron Works, Seattle, low $116,580.

Unstated tonnage, St. Raymonds School, New York; pending; James King, Empire State Bldg., that city, engineer in charge.

Unstated, Parkwater pumping station, Spokane, Wash.; McGinnis Construction Co. and Henry George & Sons, Spokane, joint low, $193,713.

Unstated, improvements to Broadway bridge, Portland, Oreg., bids to Oregon Highway Commission, Portland, Aug. 1.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, Grosvenor apartment house, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

1453 tons, state bridge, Yorktown, Va.; bids Sept. 1; 230 tons of sheet piling also required.

170 tons, Public Roads Bureau, bridges in Okanogan and Whatcom counties, Washington state; general contracts placed.

Unstated, state grade separation, Baker, Oreg.; Valley Construction Co., Portland, Oreg., low $434,547.

Unstated, two steel and concrete bridges, Rosebud and Fallon counties, Montana; bids to Helena, Aug. 3.

PLATES . . .

PLATES PLACED

250 tons, water storage tank, Coulee, Wash., to Consolidated Western Steel Corp., Seattle, (recommended for award).

235 tons, tanks, Perth Amboy, N. J., to Chicago Bridge & Iron Works, Chicago.

PIPE . . .

CAST IRON PIPE PLACED

1300 tons, 16 and 24-in. cast iron pipe, Framingham, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

740 tons, 6 and 8-in., North Reading Mass., to Warren Pipe Co., Everett, Mass.

330 tons, Metropolitan District Commission, Hartford District Commission, Hartford, Conn., to R. D. Wood Co., Florence, N. J.

260 tons, 6 to 24-in., New Bedford, Mass., to R. D. Wood Co., Florence, N. J.

CAST IRON PIPE PENDING

Unstated, five irrigation systems, 3 to 16 in. pipe, alternative for steel mains; bids in to Yakima, Wash., Aug. 1.

RAILS, CARS . . .

RAILROAD CARS PLACED

Solvay Process Co., 100 aluminum tank cars, with stainless steel fittings, to General American Transportation Co., Chicago.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

FORREST CITY, ARK.—Arkansas Power & Light Co., Pine Bluff, has awarded a $15 million contract to Ebasco Services, 2 Rector St., New York, for erection of a power station near here.

CALIFORNIA

LOS ANGELES—Lever Brothers Co. has begun construction of a $25 million soap and food products plant at Anaheim Telegraph Rd. and Washington Blvd. Largest private industrial plant in Los Angeles history, it will occupy a 30-acre tract, and will require 15 months to complete.

LOS ANGELES—California Institute of Technology has awarded a $650,000 contract for an engineering laboratory building.

IDAHO

BOISE, IDAHO—Baxter Foundry, heavily damaged by fire, will be rebuilt. Machinery and equipment were lost.

ILLINOIS

BELLWOOD, ILL.—Sauerman Bros. Inc., 522 S. Clinton St., has awarded separate contracts totaling $200,000 for construction of a plant. Engineers are J. L. McConnell & Associates 53 W. Jackson St., Chicago.

CHICAGO—David Berg & Co., 167 S. Water Market St., plans a $200,000 factory alteration and modernization program. Architect is A. Epstein & Sons Inc., 2011 W. Pershing St.

CHICAGO—Burny Bros. Inc., 2747 W. Van Buren St., has awarded a $950,000 contract to Enger Bros., 4910 St. Paul Ave., for construction of a bakery plant.

CHICAGO—Cherry Meat Packers, 4742 S. California St., has awarded a $156,670 contract to Martin J. Ingram, 228 N. LaSalle St., for construction of a meat packing plant.

KANKAKEE, ILL.—*Kankakee Journal* plans to build a $1 million 1 and 2-story publishing plant. Architect is Philip D. West, 188 N. Wabash St., Chicago.

INDIANA

GARRETT, IND.—Hubbard Spool Co., 1622 W. Carrol St., Chicago, has awarded a $200,000 contract to Bulley & Andrews, 2040 W. Harrison St., Chicago, for construction of factory and office buildings.

IOWA

DES MOINES, IOWA—Winston & Newell Wholesale Grocery Co., 118 Fourth St., plans to build a $500,000 warehouse addition.

KANSAS

WICHITA, KANS.—Overend & Boucher, 1005 Broadway, are the architects for a $300,000 commercial garage. Architects serve as agents for the owner.

MINNESOTA

FOSSTON, MINN. — Fosston Co-operative Creamery will build a $175,000 locker plant. Plans are by M. & G. Buetow, 1931 University Ave., St. Paul.

ST. PAUL—Cities Service Oil Co., 500 Robert St., has awarded a $200,000 contract to J. S. Sweitzer & Son, 739 Pillsbury Ave., for construction of a warehouse at Fairview and Thomas Aves.

NEW JERSEY

JERSEY CITY, N. J.—General Foods Co., 250 Park Ave., New York, plans to build a $300,000 warehouse on Waldo avenue near Academy street.

NEW YORK

BROOKLYN, N. Y.—Kinway Realty Inc., 15 Court St., will build a $120,000 garage at 54-65 Kermit Place. Plans are by Joseph B. Yesselman.

OHIO

ASHLAND, O.—Northern Ohio Telephone Co. plans to build a $465,000 telephone building on Main street with all automatic equipment.

CLEVELAND—Standard Oil Co. of Ohio has engineering work in progress which may lead to construction of $4 million crude oil distillation unit here.

MANSFIELD, O.—Weldon Bldg. suffered a $100,000 fire which caused damage to its 15 commercial and industrial tenants.

OREGON

PORTLAND, OREG.—T. E. & J. C. deShazor, 1900 S. W. Water St., have awarded a $175,000 contract to Wilson & Dean, 2023 N. E. 58th St., for construction of a plastic arts center.

MADRAS, OREG.—Warm Springs Lumber Co. will replace its planer mill at a cost of $150,000.

PORTLAND, OREG.—Kaiser-Frazer Motor Co., Willow Run, Mich., will build a $500,000 assembly plant here. Architects are Wolff & Phillips, Portland.

PENNSYLVANIA

PHILADELPHIA—E. I. du Pont de Nemours & Co., Inc., Nemours Bldg., Wilmington, Del., has awarded a $1.5 million contract to Wark & Co., 1700 Sansom St., for construction of a research laboratory.

TENNESSEE

MURFREESBORO, TENN.—A. H. Poppe, New Bremen, O., will build a $200,000 dehydrating plant here.

TEXAS

ALBA, TEX.—Alba Oil & Refining Co., c/o Alba Reporter Publishing Co., plans to build a $1 million refinery.

HOUSTON—Felix Doran Jr., 3916 Main St., Dallas, will build a $275,000 warehouse adjacent to Highland Industrial Terminal.

NEW ULM, TEX.—McCarthy Oil & Gas Corp., Shell Bldg., Houston, plans to build a $5.5 million gasoline absorption plant here and will also spend $250,000 on area gas lines.

SWEETWATER, TEX.—Lone Star Cement Corp., First National Bank Bldg., Dallas, plans to construct a $250,000 cement plant near here.

VIRGINIA

ROANOKE, VA.—Magic City Laundry, 902 13th St. S.W., is rebuilding its laundry at a cost of $100,000.

WASHINGTON

KENNEWICK, WASH.—Election has been set for Aug. 29 to pass on proposed water system bond issue for $1,150,000. City plans to purchase holdings of Pacific Power & Light Co. and Kennewick irrigation district for $390,000. Balance of the funds would be used for a filtration plant, and expansion and improvements to consolidated systems.

SPOKANE, WASH.—P. G. McInnis and Henry George & Sons, joint low bidders at $193,713, have the award for construction of city's proposed Parkwater water pumping station.

WEST VIRGINIA

WHEELING, W. VA.—Wheeling Electric Co. will soon begin an $18 million expansion program which will mean greater electric service for Wheeling, Moundsville and Benwood, W. Va., and East Liverpool, Steubenville and Wellsville, O.

WISCONSIN

MANITOWOC, WIS.—*Manitowoc Herald-Times* has awarded a contract to Kasper Construction Co., Manitowoc, and other firms for a $125,000 plant.

CANADA

EDMONTON, ALTA.—Gaults Alberta Ltd., Revillon Bldg., plans to build a $300,000 warehouse and office. Architect is N. C. McKernan, 3 Credit Fancier Bldg.

TORONTO, ONT.—Lily Cups Ltd. plans to contruct a $500,000 plant.

TORONTO, ONT.—Longworth Milling Co. Ltd., 7 Vine Ave., plans to build a $200,000 plant and warehouse.

TORONTO, ONT.—Morris Summit Gold Mines Ltd., c/o E. M. Thompson, president, 86 MacLean St., will spend $100,000 on a mill and a 7.5 mill road to Salmon Gold Mines.